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A STUDY OF SPATIAL ORIENTATION OF CHILDREN*

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Editor's note: Spatial orientation is a matter of general concern since all of us live and move about in a world of fixed objects: The author presents a study of the spatial orientation of school children in the later elementary school grades.

ALL of us live in a world of objects many of which have fixed positions. We are continually reacting to the spatial patterns formed by these objects. The family residence is at the *corner* of the block, the grocery is *opposite* the fire station, the lost tourist is instructed to go one block *west* and two blocks *north* to reach the hotel, the sun appears in the *eastern* sky, etc. Presumably our happiness and our success are in part dependent upon our ability to gain control over the spatial patterns of the objects with which we come in contact in our daily activities and to move efficiently among them.

The investigation herein reported had for its purpose the study of the ability of children in the later elementary school grades to exhibit spatial orientation. By spatial orientation is meant

> . . . the localization of objects in imagination either with reference to oneself, to one another, or fixed, standard directions.[1]

It will be noted that three methods of localization are suggested in Freeman's definition, namely—location of objects with reference to oneself; location of one object with reference to a second object, the location of which is assumed to be familiar; and location of objects by use of a system

* Abstract of a dissertation submitted in partial fulfillment of the requirement for the degree of Doctor of Philosophy in the University of Michigan. (April 1936)

[1] Freeman, Frank N. *Psychology of the Common Branches* (Boston: Houghton Mifflin Co., 1916), p. 164.

of fixed directions. According to Freeman the genetic development of orientation follows a series of stages which approximates the order in which the methods were just presented.

The study concerned itself with the measurement of the ability of children to deal with three phases of spatial orientation. First, ability to designate directions in space; second, ability to describe the spatial arrangement of familiar places, streets, etc. in terms of the conventional system of fixed direction and in terms of location in space with reference to the subject; third, ability to maintain one's orientation during travel. A more detailed description of the test will be given in later sections.

The writer has collected numerous statements from parents and teachers which describe their difficulties in orientation. According to their testimony, defective orientation seems to be traceable to the persistence of incorrect patterns developed in the elementary grades. For the most part these patterns were developed in fixed situations: i.e. several years of school experience in a seat which faced east, or years of instruction from a map which hung on south walls on a schoolroom. The attitude of an adult who is confused in habits of orientation and the common remedy is well illustrated by the following letter which was received by a county school commissioner in Southern Michigan.

Dear Mrs. ----------:

When a child I attended this same school, and when it came to geography got mixed on directions. Then a county school com. was the instigator of refurnishing and reseating the school house, the seats facing north. The school house burnt not long after and the present one was built. The officers, much like Will Carleton's *The School Master's Guests,* insisted on putting the seats back as in the other house. Would there be any way the pupils could face north while studying their lessons in geography. Should this be out of place, please excuse it and do not mention it.

Sincerely interested
Grandma ----------

The importance of developing ability to orient oneself correctly has long been stressed in geography textbooks. As early as 1813 Cummings prefaced his first book as follows:

In teaching geography, let the pupils sit (sic) with their faces toward the north. Trifling as this may appear, it is of great importance ---------- ------ Learners should always be required, for a considerable time at least,

to point out the place asked, either with their finger, or something else they may hold in their hand for the purpose.[1]

Later nineteenth century textbooks used illustrations to help children fix directions in mind; for example, pictures of the compass or an arrangement of lines to represent the compass points. The association of directions with bodily positions illustrated by the use of pictures was used. The following excerpt from old texts are typical of the latter method:

If you stand with your right arm towards the East, West will be on your left hand, North will be before you and South behind you.[2]

PREVIOUS STUDIES

A survey of the literature on the general topic of orientation reveals that the majority of articles deal with some phase of teaching directions to children. A few studies are available, however, which do report attempts to measure the ability of either children or adults in dealing with directions. The particular studies which have a direct bearing upon the present investigation are summarized here. For convenience of discussion they are grouped under the following headings: (1) Studies with adults as subjects; (2) Studies with children as subjects.

Studies with Adults as Subjects

Perhaps the most important and the most scientific study in the field under discussion was carried on by Trowbridge and financed by the New York Academy of Science.[3] His purpose was to study the methods of orientation used by adults. He introduces his article with the general statement that

. . . there appears to be two radically different methods; one used by civilized man, the other chiefly by living creatures of a lower order. The former, which employs the points of the compass, is acquired artificially by education. It is proposed to call this the *ego-centric* method. The latter is used not only by birds, beasts, fish, insects, etc., but also, in all probability by young children and by a large proportion of mankind living in an un-

[1] Cummings, J. A. *Introduction to Modern and Ancient Geography* (Boston: 1813), p. 114.

[2] Warren, D. M. *Common School Geography* (Philadelphia: Cowperthwait and Company, 1868), p. 6.

[3] Trowbridge, C. C. "*Fundamental Methods of Orientation* and Imaginary Maps," *Science*, XXXVIII (Dec. 19, 1913), pp. 888–897.

civilized state. In this system of orientation, the points of the compass play little if any, part and it may be designated as the *domi-centric* method.[1]

Trowbridge's data were collected from sketches made upon large circular pieces of paper. New York City was represented in the center of the circle and each subject located several distant places with reference to it. Graduate students and college teachers were used as subjects. Trowbridge analyzed the sketches made by his 27 subjects and worked out the apparent arrangement of places as imagined by each.

These imagined patterns which he terms "imaginary maps" are to be distinguished from the correct patterns which are recognized by an individual if he reflects a moment. Trowbridge reported finding four major types of imaginary maps among his subjects: (1) Persons of a fairly consistent deviation from the correct directions for the entire circuit of the compass; (2) persons with different imaginary maps in different localities; (3) persons who imagine north as always being directly in front of them; (4) persons who imagine that all distant points lie either west or east of them. Trowbridge estimates 30 to 50 per cent of adults possess incorrect imaginary maps.

Ridgley reports having interviewed numerous teachers relative to the ease with which they used directions.[2] He estimates that fully 95 per cent experience considerable difficulty. It is his opinion that, in most cases, the difficulties were traceable to poor teaching.

Studies with Children as Subjects

Gulliver reported in 1908 an informal investigation of children's ability to use directions in map drawing of their immediate school surroundings.[1] He did not report the details of his investigation but presented the general conclusion that

Children apparently have no fixed point of orientation which guides them in drawing a map of a known area. They are nearly as likely to put the east or the west to the top as the north. They seldom place the south at the top. Even when they are told where the north and south line lies in the schoolroom, they are generally unable to draw with correct orientation a map of a few streets which they know intimately.[2]

[1] *Ibid.*, p. 888.

[2] Ridgley, Douglas. The Teaching of Directions in Space and on Maps," *Journal of Geography*, XXI (1922), pp. 66–72.

[1] Gulliver, F. P. "Orientation of Maps", *Journal of Geography*, VII (1908), pp. 55–59.

[2] Ibid., pp. 57–58.

In a recent investigation reported by Howe, 1300 children from kindergarten through Grade VI were used to measure ability to use directions in space and on maps.[8] Each child was taken out of doors to the school grounds. Those who were in the kindergarten and Grades I, II, and III were asked to point north and to point east. A record was made of the directions in which they pointed and their reasons for pointing in the particular direction which they believed to be north. As each child returned to his room, he was again asked to point north and to give his reasons. The children above Grade III were given the same tests as the younger children, and in addition they were asked to indicate east on a wall map and to give the reasons for their choice.

The eleven per cent of children who reported that they used natural objects such as sun, stars, etc. in determining directions were more accurate than those who did not. The child's home, contrary to expectations played little part in his knowledge of directions. Over 60 per cent of the reasons for choosing a direction as north were meaningless to the teacher who did the examining. The boys tended to exceed slightly the girls in ability.

Howe followed his investigation with a remedial program designed to develop a clear concept of directions in space based upon sun behavior and to determine the level at which such instruction should begin. He used approximately 300 children in Grades I, II, and III and gave them experiences in observing the position of the sun during early morning, noon, and late afternoon. The pupils were drilled on the directions associated with the positions of the sun. After a ten weeks observation period the pupils were tested nearby and away from the school building, being asked to point out the various directions both in the morning and in the afternoon. Approximately 50 per cent of the children in Grade I, 75 percent in Grade II, and 88 percent in Grade III gave correct responses. Over 90 percent of the answers showed that the children had made deductions with regard to directions and the sun's behavior. Howe concluded that children could acquire a clear concept of directions in space especially in Grade III if proper drill is given out-of-doors nearby and away from the school.

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[8] Howe, F. George. "The Teaching of Directions in Space", *Journal of Geography*, (May, 1932), pp. 298.

TESTS AND THE SUBJECTS

This investigation has for its purpose the description and interpretation of certain orientational abilities of children in the later elementary grades of rural schools. The types of abilities investigated are suggested by the four major tests used. These were:

I. Test of orientation with reference to directions in space—or the ability to designate the cardinal and intermediate directions by pointing into space.
II. Test of orientation with reference to cities in space.
  Part A. Ability to point in the direction of both distant and nearby cities.
  Part B. Ability to show by a simple sketch the spatial arrangement of local cities and villages.
III. Test of orientation in the community.
  Part A. Ability to indicate the direction of streets.
  Part B. Ability to give the location of stores, etc.
  Part C. Ability to indicate the directions seats face in theaters, auditoriums, etc.
  Part D. Ability to show locations of places in a familiar city by constructing a single map.
IV. Test of ability to maintain orientation during travel.

It was necessary to evolve a method of recording objectively the responses of the subjects as they pointed out directions in space. The technique used by Trowbridge for testing adults did not seem adequate for use with children. Howe's oral technique is rather slow to be used by a single examiner and perhaps somewhat subjective since the examiner must estimate the direction being pointed out by the subject's gestures.

After much preliminary experimentation satisfactory techniques for individual and group testing were developed. The apparatus for individual testing is shown in Figure I. It consists of a revolving organ stool to the seat of which a pointer was attached and a device for automatically indicating its position. As the seat was revolved and then brought to rest with the pointer in any given direction, an electrical connection was made through a contact point suspended under the seat and touching one of sixteen copper plates. These plates corresponded in arrangement to the cardinal and intermediate directions. Before the stool could be used, it had to be oriented with the aid of the compass in such a way that the copper plates coincided

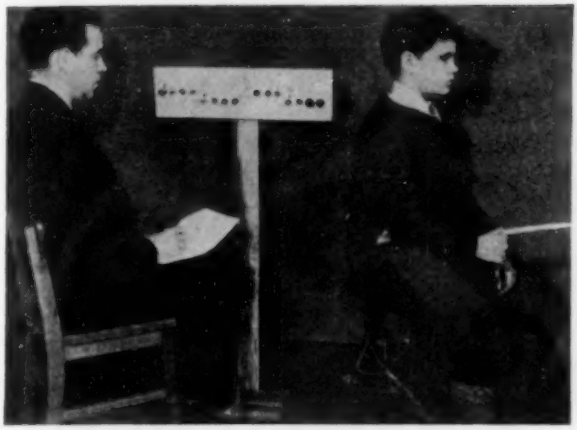

Figure 1. Subject being tested with apparatus used for individual tests of directions in space.

with the directions in space. As the contact point touched any one of the plates a circuit was completed and a light flashed on a panel before the examiner to indicate the direction of the pointer. The apparatus was used for individual testing during a preliminary investigation which provided data to compare with results obtained by the group test.

For group testing a device was worked out consisting of a circular cardboard about fifteen inches in diameter upon which were drawn sixteen arrows arranged like compass points. A pattern of arrows was placed upon each subject's desk in such a manner that the top edge, which was straight, could be placed in a position parellel to the front edge of the desk or table being used by the subject. When so placed, Arrow C pointed in the direction the subject was facing and all the other arrows assumed directions with reference to it. The pattern then was in a fixed position throughout the test. The subjects could respond to questions regarding directions by merely indicating the labels of the appropriate arrows. For example, if a subject facing north, was asked for the letter of the arrow pointing south, she would respond with "P" the label of the south-pointing arrow. A subject using the group test is shown in Figure 2. It was a common thing for the subjects to gesture or point with their pencils or with fingers during the tests which required indication of directions in space.

Figure 2. Subject completing a test of orientation with the material used for group testing.

The circular shape was used because it resembled a map less than the rectangular designs, and the arrow appeared more uniformly spaced when corners were avoided. Letters were used in place of numbers to designate arrows because the subjects seemed less disturbed by the jumbled order which had to be used in order to avoid the suggestion of a starting point or a key direction such as north.

Subjects

Excepting the travel test, the group tests were administered to 173 boys and 144 girls distributed rather uniformly through Grades V to VIII inclusive. The subjects were from typical rural schools of southern Michigan. In addition, the individual tests for directions in space and pointing out locations of cities were used with 79 children in Grades IV and V.

Since a familiarity with the communities in which the subjects lived was essential to success in certain of the tests, the years of residence in the community was ascertained from each child. The mean number of years for both boys and girls was 9.1. Over 93 percent indicated that they had lived in the community three years or over.

Since one of the questions raised for investigation was the effect of the direction the subject faced upon his accuracy in dealing with directions, it was important to know how constant the matter of direction faced in school was for the subjects. Therefore, each child was asked the following question: "How many years have you attended this school?" About half the subjects attended their present school a number of years equal to or greater than the number of their present grade, i.e. five years for Grade V, etc. Sixty-five to seventy percent had had all their geography instruction in the school in which the testing was done.

In order to ascertain the instructional background of the subjects, a careful analysis was made of the geography texts used in Grades IV and V. Space does not permit a detailed summary of the finding. There were 309 occurrences of the cardinal directions and 17 uses of the four intermediate directions in the descriptive material of the text for Grade IV. The directions north and south were used three times as often as any other direction. There were 41 occurrences of directions in the same book as a part of an exercise or practice material. In the text for Grade V directions occurred in the descriptive reading matter 896 times and in exercises 80 times. The analysis revealed that the pupils had had varied experiences with directions in their geographical reading which should provide a background for at least certain of the tests.

The use of children from rural schools permitted comparison of abilities of children to use directions when seated in schools which face different directions. Slightly over half the subjects faced south, about a quarter of them faced north and the remaining quarter were rather evenly divided between east and west. The high proportion of north and south facing subjects may be explained by the fact that rooms are usually planned in such a way as to provide light from either east or west.

Miscellaneous data were collected with regard to extent of individual experiences which might have a bearing on performance. Representative questions asked were:

Have you spent most of your life on a farm or in the country?
Are you a member of the Scouts? If so, how long have you been a member?
Do you carry a watch?
Do you carry a compass?
Can you tell directions by using the sun? If so, tell how you do it.

In addition, an attempt was made to ascertain the travel experiences of each child. However, most of the data proved useless since it was impossible to isolate individual experiences in such a way as to have positive evidence of their influence upon performance.

ORIENTATION WITH REFERENCE TO DIRECTIONS IN SPACE

Test I was designed to measure ability to point out directions in space. After placing the cardboard pattern of arrows parallel with the front edge of the desk, the subjects were asked to name the direction eight of the arrows pointed. The eight arrows pointed out the four cardinal directions and the four intermediate directions. The examiner observed the children carefully during the test to make certain that the instructions were clearly understood.

The four main directions were dealt with more accurately than were the four intermediate. The percentage of correct designations for each may be seen in Table I. There was a general improvement from grade to grade except for Grade VIII.

TABLE I

PERCENTAGE OF CORRECT ANSWERS BY GRADES FOR EACH DIRECTION IN SPACE
(Subjects: Grade V–84; VI–103; VII–70; VIII–59)

Directions	Grade				
	V	VI	VII	VIII	Mean
Cardinal					
North	58.3	76.7	72.9	74.5	70.6
East	75.0	79.6	77.1	77.9	77.3
South	71.4	74.7	72.9	77.9	74.2
West	73.8	76.7	80.0	76.2	76.6
Intermediate					
Northeast	57.1	65.0	81.4	69.4	68.2
Southeast	60.7	66.0	75.7	74.5	69.2
Southwest	59.4	65.0	80.0	64.4	67.2
Northwest	60.7	66.9	72.9	69.5	67.5

The boys as a group were superior to the girls. All eight directions were correctly designated by 55 per cent of the boys, while only 38 per cent of the girls succeeded on all eight tests. The mean number of correct directions for the boys was 6.15 and for the girls 5.08. The critical ratio of the difference was 4.86. The relatively poor performance of the girls is ex-

plained, in part, by the failure of eighteen of them to identify a single direction correctly.

The percentage of subjects who exhibited perfect orientation with reference to the eight directions tested when grouped according to the direction they faced in school was as follows: facing north, 69.2; facing east, 50; facing south, 35.4; facing west, 59.5. The relatively poor scores of the south facing subjects was anticipated by the writer, since this group appeared to be greatly confused while they were taking the test; the confusion seemed to be caused by the fact that their position was reversed 180 degrees from the convenient north-facing position. A position 90 degrees removed from north did not seem to be nearly as difficult to rationalize. An analysis of errors made on the four cardinal directions by the subjects who faced east, south, and west, showed that nearly 60 per cent of the errors were apparently due to a confusion of map directions with space directions: i.e. children facing south tended to say they were facing north, etc.

ORIENTATION WITH REFERENCE TO CITIES IN SPACE

In order to determine the extent to which the children could indicate the location of cities in space, two tests were devised. In one test the subjects were asked to point out the location of 20 cities by use of the pattern of arrows already described. This test was comparable to asking a person to point out locations of cities by gesturing. In the other test the subjects were required to make a simple sketch to show the arrangement in space of a number of cities within a radius of 40 miles.

Pointing out Locations

The test which required pointing out of locations included twenty cities of which ten were in Michigan and the rest were the larger cities of the United States. For convenience of reference the two groups of cities will be referred to as "local" and "distant".

The fore exercise and the oral directions were carefully planned to emphasize that the locations were to be pointed out according to *direct* routes. Practice was given in the use of the arrows in locating nearby familiar places.

In the interpretation of the responses on this test, the question arises as to just what are the limits within which one may consider an answer as being correct. The pattern of arrows used in the test, indicated sixteen direc-

tions, varying 22½ degrees from each other. It seems reasonable to assume that an error of 22½ degrees on either side of the best answer that could be obtained from a map, should be considered as acceptable or correct. This means that a response, to be considered correct, must be within the 45 degree sector in which the true answer is found. For example, if north were the best direction, either north-northeast or north-northwest were also accepted as correct.

In tabulating the data as to the relative accuracy in pointing out the locations the "distant" and "local" cities were considered separately. The locations of the former, the "distant" cities, were undoubtedly learned largely from maps, while locations of "local" or Michigan cities may have been learned from travel and from maps.

Only two of the distant cities—New York and Chicago—in the list were attempted by over 80 per cent of the subjects, the average for the ten cities being 68 per cent. As can be seen from Table II, just one third of the attempted responses were correct. A comparison of the results obtained by the individual technique with those obtained by the group tests show a critical ratio of .10 indicates no significant difference and suggests that the group tests were reliable.

The boys were able to point out more locations than the girls but when accuracy of responses were compared, there was no significant difference.

TABLE II

PERCENTAGE OF SUBJECTS ATTEMPTING AND GIVING CORRECT ANSWERS FOR THE "DISTANT" CITIES

(Number of subjects—317)

City	Attempted		Correct	
	Number	Percentage	Number	Percentage
Chicago	280	88.3	115	36.3
New York	262	82.7	99	31.2
St. Louis	206	64.9	55	17.2
Pittsburg	184	58.1	64	20.2
Denver	205	64.7	75	23.7
Boston	207	65.3	76	24.0
Los Angeles	219	69.1	58	18.5
New Orleans	197	62.1	62	19.5
Philadelphia	186	58.7	45	14.1
San Francisco	211	66.6	78	24.6
Mean	215.6	68.0	72.7	22.9

The hesitancy with which the girls responded was apparent during the administration of the test.

The subjects who faced north were twice as accurate in pointing out locations as were subjects seated in any of the other three directions. A comparison was made of the accuracy of the locations made by the subjects when grouped according to the directions they faced during the test. The results of Los Angeles are presented here as representative of the distant cities.

In pointing out the location of Los Angeles, the north-facing subjects were considerably more accurate than the other groups. The three directions, west, west-southwest, and southwest, were designated by over 60 per cent of the subjects of this group. Relatively small percentages were shown for the other directions. There was then a very definite direction associated with Los Angeles by the north-facing group.

The east-facing group divided their answers between a general northwest direction and the southeast direction. Northwest would be expected as the response if the subject considered the direction he was facing as north. This wrong location suggests an "imaginary map" which is based on an error of 90 degrees due to repeated experience in seeing the map with the top to the east. The writer is unable to account for the relatively large proportion of southeast answers.

The placement of Los Angeles by the south-facing group shows the choice of two directions by most of the subjects—east and west. The west placement is satisfactory for this is the correct general direction. The east placement might be interpreted as the result of an "imaginary map." To subjects facing south, Los Angeles appears to the left side of the map. The direction in space to the left of a south-facing subject would be east. There is a definite suggestion here of two main types of "imaginary maps." One coincides with reality and the other is reversed 180 degrees from the true map. The latter type is undoubtedly related to the repeated experience in seeing the map of the United States in a position which is reversed 180 degrees from the correctly oriented map.

The "local" cities were located with slightly greater accuracy than were the distant cities. Table III presents the number and per cent of correct locations for the local cities.

TABLE III

PERCENTAGE OF SUBJECTS ATTEMPTING AND GIVING THE CORRECT ANSWERS FOR THE "LOCAL" CITIES

City	Attempted		Correct	
	Number	Percentage	Number	Percentage
Detroit	301	94.9	171	54.0
Grand Rapids	217	68.4	58	18.4
Kalamazoo	184	58.0	54	17.0
Port Huron	163	51.4	50	15.7
Flint	211	66.6	71	22.4
Lansing	243	76.6	67	21.1
Saginaw	178	56.1	77	24.3
Monroe	143	45.1	42	13.2
Jackson	247	77.9	114	36.0
Pontiac	155	48.9	61	19.2
Mean	204.2	64.4	76.5	24.1

The relatively high degree of accuracy in placing Detroit in space is no doubt related to opportunity for actual experiences with spatial relations between the pupils' home community and this city. Experience in travel, experience with directions of main routes, observation of busses en route, etc., all would help to build up place associations.

Observation of the children at work during the tests and the discussion of responses with them afterwards brought out some interpretations worth noting. The strength of "imaginary maps" apparently varies with different individuals. Some of the subjects located places incorrectly and insisted that they were correct; others noticed their errors and corrected the answers before handing their tests to the examiner. There were subjects who used both correct and incorrect "imaginary maps"—the correct one for near-by cities such as Jackson and Detroit, and the incorrect ones for "distant" cities. Frequently such subjects did not recognize that they were using two patterns of arrangements. They were able to "slide" from one to the other without being aware of it.

Locating by Sketching

The second test of orientation with reference to cities in space consisted of having the subjects make a simple map by placing dots and numbers to represent the spatial arrangement of sixteen cities and villages in Michigan. All but six of the places were within a radius of ten miles of the territory in which the testing was done. A dot in the center of the

test paper showed a city which was familiar to all the subjects. This city served as a point of reference for locating the other places. In order to control the factor of distance on the sketch two concentric circles were drawn on the test paper. The instructions listed the nearby places and directed that their arrangement be shown in the inner circle and that the list of more distant places be shown in the outer circle.

In scoring the test a stencil was used for determining the segment, or sector, of the circle in which any given city was placed. The exact center of each segment was one of the four cardinal directions, or one of the four main intermediate points. The top and sides of the stencil were labeled with the correctional map directions. This stencil was placed on top of the test being scored in such a position that the outer circle of the stencil coincided with the outer circle of the test. Then the stencil was turned to the position which represented north in *space* for the particular subject whose test was being scored. For example, if a subject faced south during the test, the north sector of the stencil was placed toward the bottom of the test paper. This procedure was followed in order that a given sector on the stencil would always have the same meaning in terms of a particular direction despite the position of the subject while taking the test.

There were two distinct methods of arranging answers. A subject may arrange the cities according to conventional map directions by considering the top of the page as north, the right as east, etc. Hereafter such answers will be referred to as *map answers*. He may, however, attempt to visualize the locations of the cities as they are arranged in space about him, and place dots and numbers to represent this arrangement. If a subject were facing south, he would visualize Detroit as being to his left and place a dot to represent it on the left side of the page. Ypsilanti would then be represented in a position between Ann Arbor and Detroit. The term *space answers* is used hereafter to refer to such answers. If the subject were facing north, his map arrangement of the cities, and the arrangement as he visualized it in space about him would, of course, be the same.

Nothing in the instructions suggested the use of either method of arranging the cities. Suggestions were deliberately left out in order to ascertain which method the subjects would normally choose. It was hoped that the method chosen might be indicative of the subject's orientation level.

It was not expected that the subjects would be familiar with the location of all the cities, but rather that the list would provide a basis for

representative responses which would indicate whether the subjects had developed patterns of spatial arrangement. Consequently the major concern is not with the number of cities located correctly but with the method of locating and the accuracy of the attempts.

Of the 1,251 responses made by the boys, 8.2 per cent were in the correct map sector, and 12.8 per cent were placed in either of the adjacent sectors. The space answers are distributed—30.5 per cent in the correct sector and 29.3 per cent in the adjacent sectors. Of the 980 responses of the girls 10.5 per cent of the map answers were in the correct sectors and 16.4 in the adjacent sectors. The space answers were distributed evenly—27 per cent in the correct sector and adjacent sectors. It should be pointed out that there are two sectors adjoining the one correct sector, and so, on the basis of chance, the answers placed in the adjacent sectors are not on a par with those in the correct sectors.

The ratio of space answers to map answers is approximately two to one. When space answers were given, a greater proportion of them were placed in the correct sector than were the map answers. Almost twenty per cent of the responses could not be classed as either map or space answers. The girls gave a slightly higher percentage of map answers than did the boys.

The number of subjects who attempted to locate individual cities varied greatly as might be expected. The best known cities were located with less than 50 per cent accuracy. Two children arranged correctly fourteen of the fifteen places, while several were able to arrange only one or two.

It was observed in the previous test that as the subjects pointed out Michigan cities they apparently located them in space without recalling their position on a map. There was little evidence of the "imaginary maps" which were so prominent in the results of the tests on distant cities. The results indicate that a child may locate a city with either of two patterns of directions in mind. If the city is relatively near he may locate it by visualizing its position in space with reference to himself. If a distant city is to be located, he may place it in terms of the particular map position in which he has visualized it from day to day. In the latter case, if he fails to think of the map in an oriented position, he then locates the city in question with an incorrect arrangement of directions in mind.

ORIENTATION IN THE COMMUNITY

In order to determine whether the children had learned to arrange places in their community according to the conventional system of fixed directions, Test III was incorporated in this investigation. The test required that the subjects give the location in terms of fixed directions of familiar places in either of two trading centers which were in the region in which the school were located. The items dealt with the following: (A) locating stores, public places, etc., by telling on which side of the street each is found, (north, east, etc.); (B) giving the direction of principal streets; (C) giving the direction seats face in theaters, auditoriums, etc., (D) sketching a map to show how certain public buildings, parks, etc. are arranged in space.

It was not expected that any one child would be familiar with all the places referred to in the test. In order to determine which of the places were within the experiences of each child, the lists of places were read orally by the examiner while each child crossed out those places with which he was unfamiliar. To help the children decide which of the places should be crossed out, the examiner made such statements as the following—"Cross out those places you could not easily find if your were in ---------" "Could you go right to Mack's store if you were in --------- " When this was completed the subjects proceeded to give the location of those places remaining in the lists. Most of the subjects elected to use the list which related to the larger trading center—Ann Arbor. Consequently all results presented here relate to this center.

Locating familiar buildings. The first list includes such places as stores, banks, theaters, and recreation centers. Over half of the places were attempted by three fourths of the subjects. The average percentage of places attempted was 68 for the boys and 66 for the girls. However, both groups were very inaccurate in their locations: the boys succeeded in locating 23 per cent correctly while the girls only located 12 per cent correctly. The most familiar place and the most often located correctly was a national chain store. Places on intersections were especially troublesome as the subjects had difficulty expressing locations involving two directions.

Direction of streets and bridges. The second part of the test called for giving the direction of streets and bridges. Over 80 per cent of the subjects were familiar with the streets in the test and succeeded in giving a higher

percentage of correct responses than were given in the preceding part of the test. The boys were correct on 54 per cent of their responses and the girls succeeded in giving correct responses in 43 per cent of the cases.

Seats in the theaters. The third part of the test required that the subjects give the direction they face when seated in theaters and auditoriums. It proved difficult for the subjects to handle these exercises. Less than a third of the attempts were correct for the best known theater. The girls again proved less able than the boys. The former responded correctly on only 17 per cent of the attempts while the boys were correct in 20 per cent of the cases.

Mapping. In the fourth part of the test the subjects were required to make a map showing the spatial arrangement of well known places within the city limits. The list included such places as a stadium, a hospital, fair grounds, etc. The test was scored by using the stencil described in an earlier test. Slightly over half of the subjects attempted to locate the places, with 16 per cent of the boys and 11 per cent of the girls succeeding in their attempts.

The construction of the map caused considerable difficulty for the subjects, particularly in the arrangement of places according to fixed directions when the subjects faced in a direction other than north. For example, it was confusing for a child facing south to make a map with north at the top. A few subjects avoided this confusion by turning the test paper around so that north on the map coincided with the space direction, north, in other words, they oriented the map.

The results of the four sections of the test show that the subjects had for the most part failed to arrange places familiar to them into the conventional pattern of directions. The responses were inaccurate and often contradictory. Even though the subjects claimed they were familiar with the places and attempted answers, they did not exhibit control over the use of conventional directions.

ABILITY TO MAINTAIN ORIENTATION DURING TRAVEL

Some skill in orientation is necessary when traveling. The degree and kinds of skill needed are not well known. A person may travel extensively without making use of the cardinal directions. He may be guided by a general appreciation of the spatial relations between fixed objects, or between his position and his home or other familiar places.

Some persons use the type of orientation in which the self is at all times oriented in terms of the cardinal directions. These fixed directions constitute a "framework", in which the individual relates himself and other subjects.

In order to determine which type of orienting ability children would exhibit when tested in the out-of-doors, a field test was included in this investigation. The test required actual travel over relatively unfamiliar territory. The specific purposes of the test were to determine (1) whether the subjects would orient themselves in terms of cardinal directions or with reference to familiar objects, (2) the extent of the subjects' ability, and (3) the factors influencing the maintenance of orientation during travel.

Two routes of travel were selected in a residential section of Ann Arbor. The routes were approximately two miles in length. One followed a rather involved course, including a complete circle while the second route included all right angle turns and was slightly shorter than the first.

For purposes of testing and as points of reference, three stopping places were planned on each route. They divided the route into approximately three equal parts and formed an "L" with the third stop at the "toe" of the "L". This meant that the three points of reference were in a simple patterned relationship which, it was hoped, would be appreciated by the subjects if they maintained their orientation during the trip.

The subjects were taken in groups of four from their schools and driven over the route by the examiner. Before each group left their school, the cardinal directions were reviewed until everyone seemed oriented. The general purpose of the test was explained. The car was driven to the starting point of the route. Then the subjects were told they had now reached the beginning of the route. A rate of approximately 20 miles per hour was maintained during the travel. When the point designated as Stop 1 was reached, the car was stopped while the subjects noted the location. They were asked to note the direction of the streets, the surroundings, etc., in order that they might remember the "stop." A small gum label was provided for each child upon which he sketched the street pattern and charted by an arrow the direction he faced while at the stop. When this was completed, the car was driven to Stop 2 and a procedure similar to that just described was followed. In addition the children were asked the location of Stop 1 with reference to their present position, Stop 2. In order to obtain

an objective record, a pattern of arrows similar to that used in Tests I and II was used. The cardboard upon which the arrows were drawn was temporarily placed in the ceiling of the car and each child made a notation as to the particular arrow which pointed toward Stop 1.

After this exercise, the purpose of which was to determine whether the children were oriented with reference to Stop 1, travel over the route was continued. At Stop 3 the subjects were asked to answer in writing a set of questions dealing with the direction they were facing at each stop and direction to their right, left, and behind them; the direction in terms of an arrow between the stops and their reasons for believing their answers were correct. However, on the second series of tests, i.e. travel on Route 2, the questions were answered at each stop in place of waiting until the end. The subjects then placed the sketches they had made of the stops upon a circular piece of paper in what ever spatial arrangement they considered correct. This sketch was intended to reveal whether the subject appreciated the pattern of the three stops and the direction he faced at each stop.

The results are based upon four sources of information (1) answers to the questions (2) analysis of the sketches (3) observations of children during travel and (4) introspective report. The results are subject to the limitations of small sampling since 33 children were taken over Route I and 25 over Route II. No child was taken over both routes since the second route was planned after it became apparent the first was too difficult for the subjects. Approximately 50 per cent of the total number were correctly oriented at Stop I but about half of these or less than 25 per cent remained oriented until they reached Stop 3. Orientation was maintained throughout the entire trip by eight, or 25.4 per cent of the 31 boys, and five, or 18.5 per cent of the 27 girls.

It is interesting to note that 50 per cent of the subjects were lost so far as fixed directions were concerned before they ever reached the first stop, even though they were aware of their directions as they left their schools.

In order to determine whether the subjects appreciated the pattern of the route independent of cardinal directions, the two tests referred to earlier were used: (1) indicating directions by designating the arrow which pointed out the places in question, and (2) making a sketch to show the general pattern of the Stops of the route.

Considering first Route I, five of the sixteen boys and four of the seventeen girls, while at Stop 3, were able to choose the arrows which pointed in the general direction of Stops 1 and 2. Some subjects were able to point out one of the stops but not the other. In general, Stop 2 was more often pointed out correctly than Stop 1.

The sketches made by the subjects who traveled over Route 1 showed that two of the sixteen boys and four of the seventeen girls were able to show the correct spatial relations of the three Stops.

Route II was easier to follow, as can be seen by the fact that ten of the fifteen boys and two of the ten girls while at Stop 3, were able to designote the arrows which pointed to Stops 1 and 2; 50 per cent of the subjects appreciated the spatial arrangement of the three Stops. As for the sketches, twelve of the fifteen boys and three of the ten girls made drawings which showed the general arrangement of the Stops. Of these fifteen subjects only five were included in those who pointed out the stops by use of the arrows. The factor of guessing, undoubtedly, operated to influence the results.

Perhaps the designation of the three Stops tended to break the trip into three more or less independent experiences and led the subject to ignore the larger aspects of the route. It is possible that a better showing would have been made if the examiner had specifically warned the subjects beforehand that they would be asked to show the arrangement of the stops. This, however, might have had the effect of causing them to pay too much attention to details such as curves, number of turns, etc. As will be pointed out later, such detailed attention is likely to lead to confusion, especially if a series of changes occur in rapid succession or in case of a brief lapse of attention.

It was thought that the position of the sun in the sky might give the children a cue as to directions. Therefore, 22 of the 58 subjects were taken on days which were classified as sunny. Of these 22 subjects, seven reported making use of the sun; however, only two of these seven subjects succeeded in giving the correct directions at all three Stops. Those subjects who had reported in the interview at the end of the route that they did not use the sun were urged to make use of it to ascertain whether they were oriented with respect to cardinal directions. This suggestion was made to fifteen subjects. Eleven reported that they could not tell directions by the use of the sun. Four tried, but only one succeeded. The observation of the subjects

during the testing definitely indicated that the sun was not an important consideration in their orientation. There was evidence of lack of experience and practice in using the sun for such a purpose.

It was apparent during the testing that rapid shifts in the direction of travel proved confusing. There was a tendency for the subjects to "keep track", as they expressed it, by a sub-vocal rehearsal of the directions as they traveled along. A sudden turn or a lapse of attention resulted in the subjects losing their "train of thought." The process was much like that found in adding a column of figures, when a lapse of attention causes one to lose the subtotal before all the numbers have been added. The children were too much concerned over minor variations in the direction of travel and not enough concerned over the general pattern of the route.

Some of the subjects resorted to interesting devices to assist them in maintaining their orientation. Two boys reported using a pencil as a pointer and keeping it in a known direction throughout the trip. For example, one of them pointed his pencil to the north as the car left his school. Every time the car made a turn he then turned his pencil the number of degrees necessary to keep it pointing to the north.

One girl said she made use of her thumb nail, by writing on it the direction in which she was traveling. When the car turned a corner, she would rub her index finger across her thumb nail to erase the old record and would then write the new direction. Such tricks suggest that the task was rather difficult and invited the use of special aids.

COMPOSITE SCORE

The several tests of the series all dealt with the general topic of orientation, but each differed materially from the other. The information called for on the tests came from two major sources, (1) formal study of geography and (2) experience and travel in the local community. The locations of the "distant" cities had to be learned largely from maps, while the locations of neighboring cities, the spatial arrangement of places and streets in the child's trading center, had been acquired from direct experience with the places, or with the roads, streets, etc., leading to them.

In order to get a general index of the abilities measured by the tests, a composite score for each child was worked out. The composite score was derived from the results of Tests I, II–A, and III. In deriving the composite

score, the standard deviation for the scores of each test was used to determine weighting. The sigma for Test II–A was taken as a base and the weighting for the other two tests was figured in terms of the ratios of their sigmas to this base.

The distributions of the weighted scores was fairly normal. The range of scores is marked—from 5 to 185. The superiority of the boys over the girls is again evident. Six girls received scores below the lowest score of the boys and three boys made scores which exceeded the best score made by the girls. The means and sigmas of the composite scores are given in Table IV.

TABLE V

MEAN COMPOSITE SCORES AND STANDARD DEVIATIONS FOR BOYS AND GIRLS ON TESTS I, IIA, AND III

Sex	Mean	S. D.	Critical Ratio
Boys	82.9	34.65	4.75
Girls	60.7	33.15	

CONCLUSIONS

On the basis of the specific findings already presented in connection with the discussion of each test, the writer submits the following general conclusions:

1. Evidence has been presented to show that children do not have a well-generalized notion of the cardinal directions. They may, for example, identify south and east, but fail to identify southeast. They find it very difficult to use directions correctly in describing locations of places, etc., in their trading centers. However, when asked to point out locations of cities in space they are frequently fairly accurate—especially with near-by cities.

2. There is little evidence that children have had the necessary preliminary exercises and experiences which help them in learning directions and fixing the conventional pattern in mind. That east is opposite west is not any too well known by many children who are supposed to be reading locations from maps daily.

3. The test results show marked individual differences in orientation of children. The boys respond more frequently than do the girls and, taken

as a group, are superior. In most cases, however, the girls who do respond to exercises are nearly as accurate as the boys.

4. The direction the subjects face while taking the tests is an important factor in their success. A north-facing group is distinctly superior. A south-facing is inaccurate and exhibits definite incorrect "imaginary maps."

5. The results of the tests show that many children have two frames of reference—a conventional map frame for distant places and a "direct experience" frame for relatively near-by places. Two cities, one distant and one nearby, may be located in directions which are inconsistent with each other. A child seated in a west-facing position may indicate that Detroit is back of him; i.e. to the *east* and at the same time place Los Angeles to his left; i.e. to the *south*. His "experience frame" was used in the case of Detroit, and an incorrect "map frame" for Los Angeles. This may be done without recognizing the inconsistency.

6. One can conclude that children do not *know* directions: they *compute* them. That is, if a child were asked to point northeast, he is likely to respond by calculating much as if he were asked to add two numbers. He is likely to say, "There is north (pointing), there is east, so northeast is there ----------"

7. Those persons who have well-developed abilities with regard to orientation seem to have the cardinal directions related to their bodily position at any given time. The pattern of arrangement of the cardinal directions needs to be as well fixed as the associations of right-left and front-back.

IMPLICATIONS

The results of this study carry certain implications for the teaching of directions:

1. There is real need for out-of-door exercises, observations, and drills with regard to directions. Children lack the foundational experiences necessary to make directions in space meaningful.

2. There is need, if directions are to function as instruments in orientation, to develop in the child a close relationship between the arrangement of cardinal directions and self. True, he may become lost, but once he has identified a *single* direction, the rest of the pattern will come as second nature.

3. Experiences in all sorts of positions should be provided in order that the pattern become sufficiently generalized that one position is no more advantageous than another. If a child has repeated experiences with the map even though correctly oriented, he is likely to be annoyed if he is put in a situation which demands the use of a map in some position other than that which he has come to prefer. As a consequence, he insists upon turning the map to put it in his favored position. For example, in the event he insists on the top being to the north, and he is reading a road map while riding in a car, in all directions excepting north, he must always turn the map. If he is facing in a south-facing position he must read his map in an upside-down position.

4. The teachers must assume a great share of the responsibility for the proper orientation of the children under their instruction. During the testing the writer found instances where teachers confessed inability to state the directions in which children were facing.

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CAN ALL PARENTS EXPECT PHENOMENAL GROWTH IN THE I.Q.'s OF THEIR CHILDREN?

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Editor's note: This is the second of two articles on the constancy of the I. Q. in the current issue of the Journal. The author attributes such changes as were observed to unreliability of the scale for very young children.

IN A BRIEF article in National Parent Teacher, Wellman[1] leaves the impression that there is hardly any limit to the increase in I.Q. provided the child is surrounded with optimum opportunities for development. Such a view is likely to lead many parents to discouragement and despair rather than to the hope for a bright future for their children as is intended by Wellman.

No one would take issue with Wellman's recommendations to parents that they do the following things for the good of their childrens' mental growth:[2]

1. Watch for things the child is beginning to be able to do and provide opportunities for their practice.

2. See that the child is free from personality difficulties which interfere with mental progress.

3. Provide extensions of environment.

But, there are good reasons for cautioning parents about expecting phenomenal growth in I.Q. even if they do all these things. These reasons are:

1. In the first place, it is not wise to accept as true the I.Q.'s of children derived from tests at very young ages. And more especially is that true of the results of the tests of twelve to fifteen years ago when Wellman began these investigations. Such tests do not now differentiate perfectly between the average and above average, and a decade ago, they were not nearly as good as they are now.

2. From a report of her own findings, there is reason to believe that the increase in I.Q. slows down remarkably when the children approach those ages when the test results become more reliable.

(a) That may be seen from the following figure:[3]

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[1] Wellman, Beth L. "How the Child's Mind Grows," *National Parent Teacher*, XXXIII (January, 1939), pp. 17–18.

[2] Ibid. p. 18.

[3] Stoddard, G. D., and Wellman, Beth L. *Child Psychology* (New York: The Macmillan Company, 1934), p. 159.

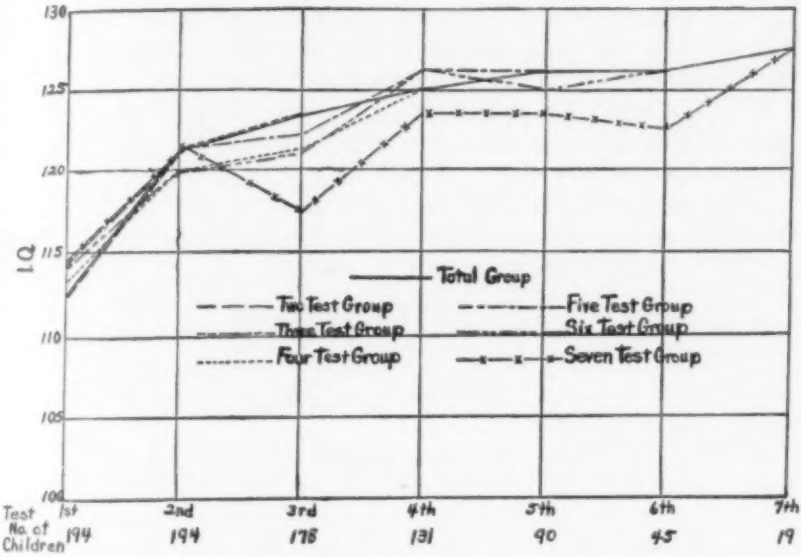

Figure 1. Changes in I.Q. on Repeated Tests Over Three to Nine Years for Children Attending Preschool Two Consecutive Years or More. (From Wellman, 471, p. 49.)

The I.Q.'s shown in Figure 1 are for testings of children of pre-school age at six months intervals and at year intervals after that. The children had attended pre-school two consecutive years or more, and so the first four tests may be taken to represent very largely the results of tests of children below 6 years of age. It is quite apparent that the curves show no significant increase after the 4th test.

(b) Taking the three individual cases reported in the National Parent Teacher article by Wellman, only one of the three shows a significant increase in I.Q. after the age of five years:

Child	I. Q. at 5	I. Q. at 10	I. Q. at 12
1	126	153	(not given)
2	167	143	143
3	146	165	154

(c) The two cases of orphanage children who were reported are rated with I.Q.'s at 1½ years. Extreme caution rather than confident assertion should accompany I.Q.'s reported for such early ages.

3. The remarkable changes in I.Q. reported by Wellman are based upon children whose background of heredity as well as environment has been considered superior.[3]

It would seem desirable before educators or psychologists hold up before the general population the hope of an almost unlimited increase in I.Q. of their children that they show:

First, that children of known inferior background can be given the optimum environment and *without exception* increase remarkably in I.Q.

Second, that children of known inferior background either in an orphanage or an unfavorable culture medium *without exception* fail to increase markedly in I.Q.

Third, that children of known superior background be placed in the rather static environment of an orphanage institution and show *without exception* marked deterioration from obtained I.Q. at very early ages.

Fourth, that children of known superior background *without exception* do not show marked increase in I.Q. from those obtained at very early ages with only an average American culture medium in which to develop. There could be other conditions imposed on those who insist that training is the only factor in mental development, but these suggestions indicate the chief problems.[4]

In conclusion, there is nothing in this article intended to discourage parents from providing their children with the most advantageous surroundings in which to develop. This writer agrees in full with Wellman's recommendations to parents for things to do to augment mental growth and in her concluding remarks that children be encouraged to make use of new knowledge and that they be provided with opportunities to exercise their minds.

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[3] Stoddard, G. D., and Wellman, Beth L. *Child Psychology* (New York: The Macmillan Company, 1934), p. 160.

[4] Simpson, B. R. "The Wandering I.Q.: Is it Time For it to Settle Down," *Journal of Psychology*, VII (1939), pp. 351–367.

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A STUDY OF THE EXPERIENTIAL FACTOR ON INTELLIGENCE TEST SCORES

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Editor's note: Educationalists and psychologists have long been interested in the experience factor in intelligence. The authors trace certain discrepancies between percentile ranks and achievement to this factor.

The Freshman Psychological Examination has become fairly well established as one means of appraisal of the student's ability to do college work. However, mass education together with the greatly increased enrollment in recent years in colleges and universities has given rise to several problems relative to the administration of the tests, and the evaluation of the scores. One of these problems which needs further investigation is in regard to the effect that previous experience in taking objective tests has on subsequent scores.

This study was undertaken for the purpose of investigating two phases of this problem: (1) The comparison of the scores of those freshmen who had no previous experience in taking objective tests with the scores of those who had taken one or more such tests previously; (2) The comparison of academic grades of those who had experience in taking objective tests and those who had no such experience.

An intelligence test purports to classify students according to native capacity, and if variations between those with and without experience are indicated, it may be safely assumed that some other factor is operating, and it may be suspected that experience is that factor. If these variations diminish or disappear with subsequent experience with objective tests, one may conclude that the lack of experience was the causal factor of the earlier deviation from expectancy; and if the findings on subsequent trials are consistently in favor of those with experience, one is justified in placing faith in his conclusions.

In this study it was found (1) that a definite difference existed between the experienced group and the non-experienced group; (2) that the experienced group made a higher median score than the non-experienced group;

(3) that the difference between the two groups decreased consistently in accordance with the number of previous tests taken. This gradual and consistent decrease would seem to be strong evidence that previous experience is at least an important factor operating to cause this difference.

The findings in this study are, by no means, to be considered as final, but, on the contrary, should be taken only as a step toward a more thorough consideration of the problems related to the procedure in the college freshman testing program.

The data in this report are based upon the scores of 1734 freshmen in the four entering classes at Marshall College from September 1935 to September 1938 inclusive. The Carnegie Mental Ability Test, Form A, was used in 1935 and 1936 and the Schrammel–Brammer Revision of the Army Alpha Examination was used in 1937 and 1938. Each student was asked to state on his examination blank the number of objective tests he had taken previously.

Since a somewhat more detailed consideration was given the results of the 1935 and 1936 scores, some of these phases will be explained first. In these two classes there were 862 students. Table I shows the distribution and scores according to the number of experiences.

TABLE I

INTELLIGENCE TEST SCORES IN RELATION TO THE NUMBER OF TESTS TAKEN PREVIOUSLY: CLASSES 1935, 1936

Number of Tests Previously Taken	Number of Cases	Median Score
0	372	116
1	319	122
2	123	126
3 or more	48	128

Of the total number, 372 who had never taken a standardized objective test before made a median score of 116. The group with one previous experience consisted of 319 students who made a median score of 122, or six points higher than the median for the no-experience group. There were 123 who had taken two similar tests, and they made a median score of 126, or ten points higher than the no-experience group, and four points higher than the one-experience group. The three-experience group consisting of 48 students made a median score of 128, or twelve points higher than the no-experience group. There was little difference in the median scores between

the students with three experiences and those with more than three. The number of such students was also relatively small and therefore of little significance.

From these data from scores of 862 freshmen at Marshall College, the following conclusions may be made:

1. The scores on Freshman Intelligence Tests definitely improve with the number of previous experiences with objective tests.

2. After three or more experiences the difference is of little consequence. This does not imply, however, that all individual differences may be eradicated merely by experience, but that it does tend to lessen the differences in median scores between the experienced and non-experienced groups in taking objective mental tests.

3. The experiential influence, although not the sole cause of differences in the scores of the two groups, nevertheless, is of sufficient importance that it may affect the classification of students for administrative purposes.

Since the data thus far had shown a consistent trend in the effects of experience, it was thought desirable also to compare the scholastic grades of the no-experience group with those of the experience group. For this purpose a sampling of 252 students was chosen. Of this number 126 or half had had previous experience with objective tests, and 126 or half had had no previous experience with any type of objective tests. Recourse was made to the mid-semester and final semester grades in order to see if the improvement was due to native ability or experience. Had the test measured native capacity irrespective of experience with objective tests there should be relatively no difference between the medians of the two sets of data taken at mid-semester and at the close of the semester, because each was a random sampling with only one variable factor, namely, the previous experience with objective tests. At Marshall the grading system is such that when reduced to quality points, A is equal to three points, B is equal to two points, and C is equal to one point. D is passing but does not carry a point value. These quality points at mid-semester, as computed for this study, however, are not a part of the official record from which the final points and grades are obtained, but as here used are computed for statistical purposes only in comparing the quality of work done in the first semester, at Marshall College. Had native ability been as pronounced as the record shown by the intelligence test would indicate, there should be as marked a variation be-

tween the two groups at the semester end as at mid-semester. If individual differences accounted for the variation in the intelligence scores of the two groups, the final semester grade should vary to an even greater degree than the mid-semester grade. In fact, the group without objective test experience that had scored lowest on the intelligence test made more rapid gain than that with previous experience with such tests. Scholastic grades at Marshall College indicated that the apparent differences between the two groups had almost disappeared at the end of the semester. In short, the conclusion seems inescapable that the median differences between the initial groups as shown by the intelligence test were traceable not to native capacity but to a lack of experience with the type of measuring instrument used. The results of this phase of the study are given in Table II.

TABLE II

A COMPARISON OF THE NO-EXPERIENCE GROUP AND THE ONE-EXPERIENCE GROUP IN RELATION TO INTELLIGENCE TEST SCORES AND SCHOLASTIC GRADES

	No Experience	One Experience
Number of students	126	126
Median Score	123	126
Average points per credit hour at mid-semester	1.0	1.2
Average points per credit hour, final	1.2	1.3
Increase in points per credit hour from mid-semester to final	0.2	0.1

Summarizing the data from this table it is found:

1. The median score for the no-experience group was 123, and that of the one-experience group was 126.

2. The no-experience group for the first half-semester made an average of 1.0 points per credit hour; but at the end of the semester the grade was raised to 1.2 points per credit hour, a net increase of 0.2 points per credit hour.

3. The one-experience group for the first half-semester made an average of 1.2 points per credit hour; and at the end of the semester an average of 1.3, or an increase of 0.1 points, as compared with an increase of 0.2 points for the no-experience group.

4. Twice the improvement between mid-semester and final grades was found in the point average of the no-experience and the one-experience group in favor of the no-experience group. This ability to improve after sufficient time has elapsed for the student to become oriented seems to add

further evidence that lack of previous experience in taking objective tests accounts at least in part for the differences in scores obtained by the various groups.

The findings from the 1937 and 1938 scores show the same general trends in regard to increase in test scores in relation to experience. Table III shows median scores in relation to experience for the class of 1937.

TABLE III

INTELLIGENCE TEST SCORES IN RELATION TO THE NUMBER OF TESTS TAKEN PREVIOUSLY: CLASS 1937

Number of Tests Previously Taken	Number of Cases	Median Score
0	106	157
1	152	159
2	73	166
3 or more	40	168

It is noted here also that the scores increase with the number of experiences. The 106 students in the no-experience group made a median score of 157; the one-experience group 159; the two-experience group 166; and the group with three or more experiences 168.

TABLE IV

INTELLIGENCE TEST SCORES IN RELATION TO THE NUMBER OF TESTS TAKEN PREVIOUSLY: CLASS 1938

Number of Tests Previously Taken	Number of Cases	Median Score
0	239	156
1	179	169
2	88	170
3 or more	17	177

In this class the no-experience group made a median score of 156; the one-experience group 169; the two-experience group 170; and the group with three or more experiences 177. Here the difference between the no-experience group and the three-experience group is twenty-one points, a rather significant difference, especially as an item of classification.

In order to determine whether or not the size of the high school which the student had attended influenced the scores, 297 students from the class of 1936 whose high schools were known, were selected at random and

divided into two groups those from cities of 5000 or more population, and those from centers of less than 5000. The following table indicates the results of this comparison:

TABLE V

COMPARISON OF SCORES OF URBAN AND RURAL STUDENTS IN REGARD TO EFFECT OF EXPERIENCE

	Population 5000 or more		Population Less than 5000	
	Number of Cases	Median Score	Number of Cases	Median Score
Experience Group	122	130	62	126.5
No-experience Group	36	129	77	115

The median score for the experienced group from the larger high schools was 130, and that for the no-experience group from the larger high schools was 129. The median score for the experienced group from the smaller schools was 126.5, while that of the no-experience group was 115.

The smaller difference between the two groups from the larger high schools may be explained through the influence of two factors: (1) It seems to be an established fact that in general, urban students test higher than those from the rural sections. (2) In urban schools the students have a greater variety of activities and exercises. They are more accustomed to interruptions of various kinds. Taking tests constitutes an interruption in the regular school routine. Any experience in encountering interruptions constitutes an experiential factor valuable in subsequent test situations. For these reasons students in larger schools are less likely to be disturbed or excited in test situations. In the smaller schools the work is more or less confined to routine, and hence an objective test—more especially an "intelligence test"—is something different and seems to interfere with their efficiency.

It seems quite possible, therefore, that the factor of previous experience may account, in part at least, for the discrepancy between the centile rank and the quality of achievement grades received. In general there seem to be more students having a low centile rank who are doing average or rather superior work than there are students of high centile rank who are doing poor work. Further investigation may show that some differential should be worked out, or that perhaps a practice test should be given to those students who never have taken objective tests prior to the one from which

the record is kept. As shown by Table I the difference between the no-experience student and the one who has had three or more experiences averages approximately twelve points in his centile rank. This means, of course, that it makes a much greater difference with some, and that this difference may, and is likely to be, such as to materially affect classification for administrative purposes.

SUMMARY

1. The scores on Freshman Psychological Examinations consistently improve with the number of experiences in taking objective tests.

2. The amount of improvement in scholastic achievement between mid-semester and the end of the semester of the freshman year was greater for the no-experience group than for those who had had experience. The fact that it was greater is perhaps of less significance than the fact that it was not materially less, as was the case with the scores, indicating that the difference in test scores was due, at least, in part, to the experiential factor rather than any actual difference in intelligence.

3. The tendency for those with experience in objective tests to make a higher score than those without such experience follows a "law of diminishing returns", and no apparent advantage is noticed after three or four experiences in taking such tests. The differential may be one of confusion occasioned by a novel experience.

4. The per cent of credit points earned was greater for the experience group the first nine weeks but the two gradually approach each other at the semester's end.

THE REVISED STANFORD–BINET FOR ADULTS*

MILDRED B. MITCHELL
Mt. Pleasant and Independence State Hospitals, Iowa

Editor's note: Few measuring instruments have had the wide use accorded the Stanford–Binet. The author presents a revision of this well known scale for which she claims better results for average and superior adults.

INTRODUCTION

THIS is the first report of work in progress at the State University of Iowa, the chief purpose of which is a critical evaluation of the Revised Stanford–Binet. On the surface, it would seem obvious that the 1937 edition would be superior to the 1916 edition, since the authors of the test have standardized it on a larger and more representative group, and have had the benefit of the results of some 20 years experience with the first edition. Furthermore, psychologists have long recognized the limitations of the 1916 edition for adults who are at least average in intelligence, because the maximum I.Q. obtainable by an adult on the 1916 edition is 122. Physicians long accustomed to relatively low I.Q.'s for their patients have been perplexed, to say the least, when receiving reports of I.Q.'s in the 130's and 140's. Some psychologists have also hesitated to use the 1937 edition because they were at a loss to interpret their results. A few studies have already appeared which throw considerable light on the subject. For instance, Hildreth[1] has published the results of "Retests with the New Stanford-Binet Scale" for children aged 3–15. Harriman[2] has recently published a study of the "Irregularity of Successes on the 1937 Stanford–Binet", for children with a mean C.A. of 11 yr. 7 mo. The work to be reported here is with adults, that is, with subjects at least 16 years of age.

The writer is preparing a study of the irregularities of adult subjects on the Revised Stanford–Binet, which incidentally, are often in marked contrast to those found for children. The present report, however, will be limited to the grosser aspects of the problem, i.e. a study of the distribution of I.Q.'s and their correlations with other tests.

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* This paper was read before Section Q of the A.A.A.S. meeting in Milwaukee in June, 1939.

[1] Hildreth, Gertrude. "Retests with the New Stanford–Binet," *J. Consult. Psychol.*, III (1939), pp. 49–53.

[2] Harriman, Philip Lawrence. "Irregularity of successes on the 1937 Stanford-Binet," *J. Consult. Psychol.*, III (1939), pp. 83–85.

SUBJECTS

There are three groups of subjects. The first consists of 155 patients examined at the Psychopathic Hospital of the State University of Iowa.[3] The second group consists of 67 freshmen in Liberal Arts. They were selected on the basis of their rating on the Iowa Qualifying Examinations given last September. This sample is not yet complete. Most of the time was spent

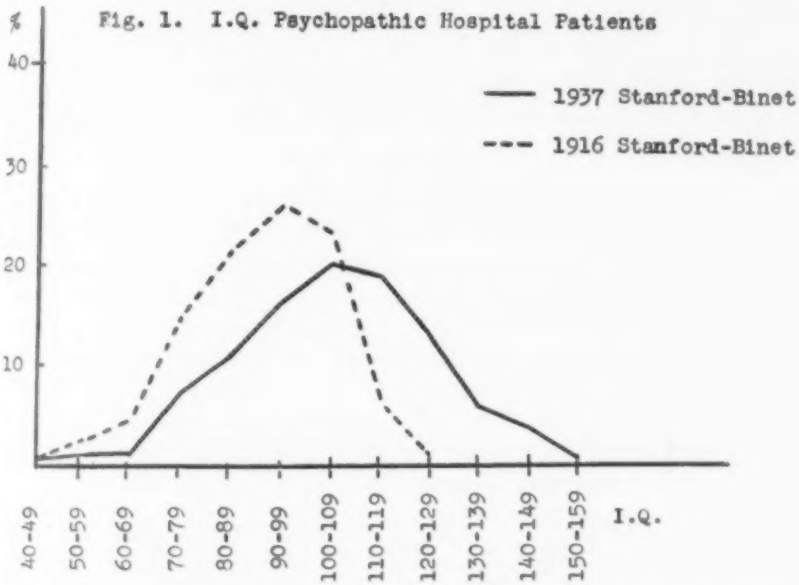

Fig. 1. I.Q. Psychopathic Hospital Patients

with the lowest part of the class in an effort to reach them before they became discouraged and left school. The third group consists of this year's class of senior medical students, 87 in all.[4]

RESULTS

Psychopathic Patients. The 155 patients were given the Revised Stanford-Binet Form L and the short form of the Stanford-Binet. The mean I.Q. on the old test was 91 and on the new, 105. The reliability of the

[3] The writer wishes to acknowledge the help of several graduate students and part-time assistants in the testing of the patients. Special thanks are due to Rosemary Lippitt, Bessie H. Harris, Oliver D. Fowler, and Leigh Carroll Douglass.

[4] The class graduating in June, 1939.

difference in the means is 2.5. The correlation for the group is .92. The mean difference of 14 points is in marked contrast to the 3 points found by Hildreth for children. She found larger differences above 11 years than below. The distribution is shown graphically in Fig. 1.

The median education for this group was Grade 12. The patients were divided into 3 groups according to their education. Those who had not gone beyond eighth grade, those who had gone to high school, and those who had taken some academic work beyond high school. The results are shown in Table I. Those in the first group had a mean I.Q. of 82 on the old scale and 91 on the new, a difference of 9 points. The next group had a mean I.Q. of 92 on the old and 107 on the new, a difference of 15 points. The last group had a mean I.Q. of 102 on the old and 121 on the new, a difference of 19 points. This is to be expected, for it is at the higher intellectual levels that the old scale was most inadequate. The I.Q. of 121 for the highest group is approximately that for the average freshman as will be shown later.

TABLE I

PSYCHOPATHIC HOSPITAL PATIENTS GROUPED BY EDUCATION

Education	No. Cases	Mean I. Q.		Difference[a]	R
		1916	1937		
Grade School	48	82	91	9	
High School	72	92	107	15	
College	35	102	121	19	
Total	155	91	105	14	2.5

[a] Part of the difference, of course, is due to using 15 as the divisor on the new test instead of 16 as on the old. If we divided the 1916 M. A.'s by 15 also, we would get differences of 4, 9, and 13 instead of 9, 15, and 19.

When the patients are grouped according to the scores on the old scale, the mean differences for each group increases with only one exception (Table II) and that was at a place where there were only 7 cases.* Of course, the number of cases is too small at the lower levels to be significant, but

[6] Bernreuter, Robert G., and Carr, Edward J. "The Interpretation of I. Q.'s on the L–M Stanford–Binet," *J. Edu. Psychol.*, XXXI (1938), pp. 312–314.

* This irregularity was eliminated when 90 state hospital cases, mostly of low I. Q., were added to these. The I. Q.'s then ranged down to the 20's with mean differences for each ten points as follows: 0, —1.1, —1.4, 1.9, 8.3, 10.1, 12.2, 14.4, 16.9, 20.4, 23.8. The mean difference for the total 235 patients was 11.6.

TABLE II

PSYCHOPATHIC HOSPITAL PATIENTS SHOWING MEAN DIFFERENCES IN I.Q. BETWEEN 1916 AND 1937 STANFORD–BINET, AT VARIOUS INTELLECTUAL LEVELS

I. Q. on 1916 Stanford-Binet	No. Cases	Mean Difference
40- 49	1	0
50- 59	4	4.3
60- 69	7	13.4
70- 79	23	11.4
80- 89	33	12.8
90- 99	40	14.5
100-109	35	17.0
110-119	10	20.4
120-129	2	25.2
Total	155	14.9

it might be mentioned that the figures obtained do not agree with the ones worked out logically and statistically from Terman and Merrill's data by Bernreuter and Carr.[6] They figured that the differences between the scales would increase at the lower levels as well as at the higher levels. Merrill[7] states that I.Q.'s above 100 are higher and below 90 are lower on the revised scale than on the old, but that the differences are not as great as suggested by Bernreuter and Carr.

Freshmen.[8] Since the new scale seemed to be giving results consistently higher than the old, it seemed advisable to try it out at the college level to see if it would discriminate at that level, or whether all the students would test high. For this reason, a sampling of those scoring in the lowest ten percentile on the Iowa Qualifying Examination were tested. When freshmen were found who obtained I.Q.'s as low as 81, it was evident that not everyone who finished high school and entered college scored high on the new test. Freshmen testing at the middle and upper ten percentile levels were also tested, and then a sampling of the entire range was started. The group at present is weighted at the lower end with 63% of the subjects below the 50% tile rating on the Qualifying Examination. The mean of 115 is, therefore, too low for the class. The mean for the 12 students tested from the middle 10% tile group is 122, which is probably more nearly the

[7] Merrill, Maud A. "The Significance of I.Q.'s on the Revised Stanford–Binet Scale," *J. Educ. Psychol.* XXIX (1938), pp. 641–651.

[8] The writer wishes to thank Asst. Dean Lonzo Jones, Mildred Heald and Dewey B. Stuit of the University Personnel Dept. for their hearty cooperation in making the freshmen available.

mean for the freshman class. It is 10 points higher than for the patients and 9 points lower than for the senior medical students as will be seen presently. The mean for the lowest 10% tile group is 103 and for the highest 10% tile group 130 with a reliability coefficient for the difference of 3.0. The correlation between the I.Q. on the Revised Stanford-Binet and the Iowa Qualifying Examination for the 67 freshmen was .76.

Senior Medical Students. The revised scale seems to be discriminating quite satisfactorily at the university freshmen level. The next question is whether it will be discriminating for a more highly selected group such as the senior medical students. After some 32 of the students had been given the revised scale, it was felt that giving them the old scale also, might prevent the continuance of the prejudice of the medical men for the old scale. It is quite certain that none of those scoring less than 100 on the old scale (and they were 16% of the group) or even those scoring less than 110

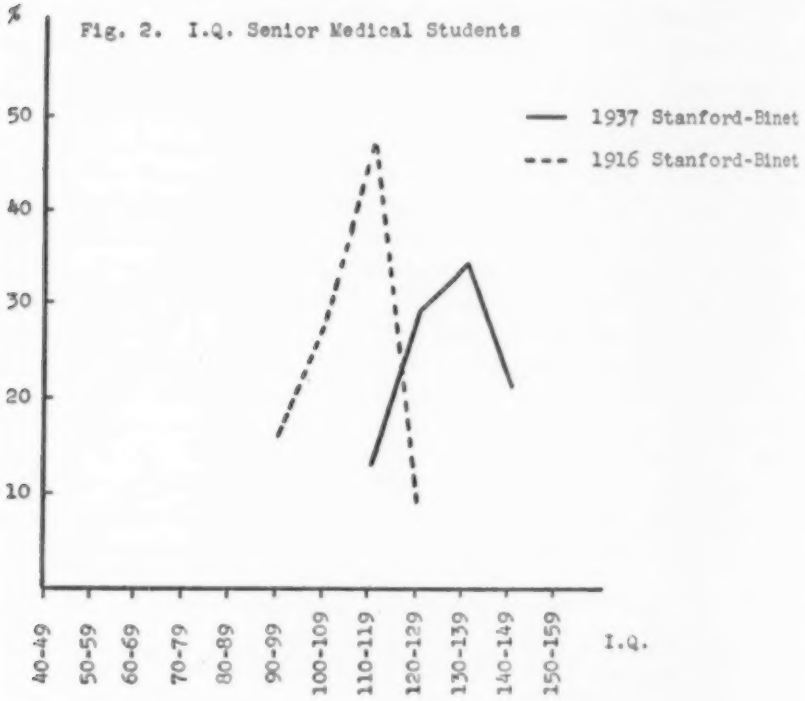

Fig. 2. I.Q. Senior Medical Students

(which was half of the class) would insist upon psychometric examinations consisting of the 1916 edition of the Stanford–Binet.

The distribution in percents for the 87 senior medical students taking the Revised Stanford–Binet and the 55 taking the short form of the Stanford–Binet is shown in Graph 2. The mean score is 131 on the new scale and 110 on the old scale. The correlation between the old and new scales for the senior medical students is only .73 in contrast to the .92 found for the patients. The reliability of the difference between the means is 4.9 in contrast to the 2.5 for the patients. This is another indication that the greatest differences between the two scales for adults come at the higher levels.

SUMMARY AND CONCLUSIONS

One hundred fifty-five psychopathic hospital patients were given the 1916 and 1937 editions of the Stanford–Binet. The mean I.Q. on the later was 105 and on the former 91. The mean difference was 14 points, the differences increasing with the intellectual level as judged by educational history and scores on the old scale. The I.Q.'s on the 1937 edition for 67 university freshmen correlated .76 with the Iowa Qualifying Examination and showed a reliable difference in means between those in the lowest and highest 10% tile on the Qualifying Examination. The middle group of the freshman scored a mean I.Q. of approximately 122. The senior medical students showed a mean I.Q. of 131 on the 1937 edition and 110 on the 1916 edition. The greatest differences between the two scales occur at the higher levels. The Revised Stanford–Binet seems to be a more useful instrument in discriminating adults of average and superior intelligence than the original Stanford–Binet.

NEWSPAPER READING INTERESTS OF HIGH SCHOOL AND COLLEGE STUDENTS

PAUL FENDRICK
State College of Washington

Editor's note: It is common knowledge that there is an expansion of interests with age. The author presents a detailed study of the topics of newspaper reading interest of 10, 11, and 12th grade high school and 2nd, 3rd and 4th year college students.

INASMUCH as reading the daily newspaper has come to be considered an essential activity in our cultural development, selective aspects of its approval or rejection by students at different academic levels might well be a matter of value to students of personality development. This particular study attempts to explore in preliminary fashion selected subject preferences in newspaper reading among secondary school students. The availability of a restricted college community* with its uniform social impacts appeared to offer qualifying uniformities for making this study.

Probably with many children the initial newspaper concern is restricted to the comic section.[1] With increasing maturity there appear the interests in sports, photograph and news sections. Likewise, a discrimination of items with respect to sex difference makes its appearance.[2] Frequency and variety of interests then presumably follow varying channels in line with mental and environmental alterations.[3] Horton,[4] examining the type of items read by college students in college papers, reports that men prefer the sports page and women campus gossip. This latter investigation, however, is somewhat restricted because of the limiting features of the typical contents of the "college" paper. Wolseley[5] reports that the American citizen "goes for" the sports, comic, society, women's and financial pages.

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* Pullman, Washington is a typical college town with the State College as its dominant enterprise. Its high school population characteristically mirrors the presence of the college.

[1] Witty, P. and Kopell, D. *Reading and the Educative Process* (Boston: Ginn and Co., 1939), p. 36.

[2] Lazar, M. *Reading Interests, Activities, and Opportunities of Bright, Average, and Dull Children* (New York: Teachers College, Contributions to Education, No. 707, 1937), pp. 64–68.

[3] Jordan, A. M. *Children's Interests in Reading* (Chapel Hill, University of North Carolina Press, 1926), 103 pp.

[4] Horton, B. J. "What Do College Students Read in College Papers," *Educational Administration and Supervision*, XX (1934), p. 697.

[5] Wolseley, R. E. "Helping Pupils Read Newspapers Intelligently," *School and Society*, XLIX (1939), p. 54.

The specific issue in the present study is the question as to the relative importance and preference of various newspaper topics as reported by samplings of students at the high school and college levels. What differences in newspaper reading appear in these student populations grouped at advanced educational levels and exposed to newspapers whose distribution and contents were controlled by common circumstances? For purposes of this study a student questionnaire was devised so that newspaper contents were classified into some 35 common categories selected to include an extensive variety of newspaper topics. Provision was made for students to indicate their attitude towards these topics in terms of the familiar like, indifferent or dislike notations as well as to signify by a separate designation the most important of these various newspaper topics. In addition, a query was made regarding the frequency with which the daily newspapers were read.

The participating groups were 10th, 11th and 12th grade high school students and 2nd, 3rd and 4th year college students enrolled in various sections of a general psychology course which had as its prerequisite a sophomore standing and was believed to represent a cross-section of the population of this particular college. Members of the first year classes were deliberately excluded from the inquiry since it was considered desirable to include only those students who would be more likely to incorporate representative membership of the institutions concerned. In fine, over 400 protocols, about equally divided between the high school and college populations, were available and these constituted the basis for making the present analyses. The representative samplings then include the entire available community high school population and approximately 5 percent of the undergraduate student body of the college.

LIKES AND DISLIKES FOR NEWSPAPER TOPICS

The first phase of the study deals with an analysis of the likes and dislikes of the high school and college students for the 35 categories of newspaper contents listed in the questionnaire. Neutral or indifferent designations were not considered and the report has been condensed to include only the percentage frequencies of the liked and disliked items.

Table I reports the incidence of likes and dislikes for the various newspaper topics designated for examination. As if a confirmation of our tabloid age (although it is quite rare to observe tabloid newspapers in this com-

TABLE I

LIKES AND DISLIKES IN NEWSPAPER READING

Topic	High School Boys (N = 105)			College Boys (N = 90)			High School Girls (N = 97)			College Girls (N = 131)		
	Like	Dislike	Diff.	Like	Dislike	Diff.	Like	Dislike	Diff.	Like	Dislike	Diff.
	(%)	(%)		(%)	(%)		(%)	(%)		(%)	(%)	
Photographs	98	0	+98	96	0	+96	96	0	+96	97	0	+97
Comics	96	0	+96	90	0	+90	94	0	+94	78	2	+76
Cartoons	91	1	+90	95	0	+95	88	1	+87	88	1	+87
Sports	86	1	+85	91	2	+89	70	2	+68	69	3	+66
Entertainment	85	2	+83	77	1	+76	91	0	+91	84	1	+83
Foreign News	71	1	+70	78	3	+75	50	8	+42	76	2	+74
Travel News	69	1	+68	73	1	+72	82	4	+78	80	0	+80
Scientific	71	8	+63	70	2	+68	34	17	+17	49	5	+44
College	64	5	+59	88	0	+88	71	3	+68	97	0	+97
Home News	64	6	+58	76	1	+75	65	6	+59	86	2	+84
Government Affairs	59	3	+56	70	5	+65	26	21	+ 5	62	3	+59
War News	65	11	+54	57	18	+39	46	25	+21	52	28	+24
Political Events	59	7	+52	76	5	+71	29	21	+ 8	65	5	+60
Crime	55	12	+43	55	15	+40	56	9	+47	55	20	+35
Headlines	50	10	+40	57	7	+50	57	9	+48	63	10	+53
Labor	37	9	+28	57	7	+50	23	28	− 5	43	11	+32
Editorials	35	9	+26	53	8	+45	33	16	+17	48	6	+42
Weather	37	8	+29	27	9	+18	24	10	+14	24	5	+19
Industrial	37	12	+25	30	8	+22	6	29	−23	19	16	+ 3
Employment	32	11	+21	48	6	+42	27	18	+ 9	46	4	+42
Columnists	34	13	+21	48	9	+39	41	19	+22	47	2	+45
Medical	27	11	+16	42	6	+36	38	12	+26	46	5	+41
Farm	26	15	+11	20	19	+ 1	9	37	−28	18	28	−10
Want Ads	21	15	+ 6	18	20	− 2	15	22	− 7	18	15	+ 3
Book Reviews	22	22	0	18	21	− 3	37	16	+21	49	11	+38
Religious	11	19	− 8	18	18	0	29	21	+ 8	31	11	+20
Vital (Births, etc.)	11	20	− 9	12	16	− 4	32	12	+20	46	4	+42
Fraternal	14	26	−12	10	19	− 9	15	33	−18	24	18	+ 6
Letters	20	33	−13	29	21	+ 8	37	20	+17	30	19	+11
Poetry	16	39	−23	18	35	−17	35	24	+11	43	16	+27
Financial	11	35	−24	15	33	−18	3	58	−55	5	46	−41
Scandal	21	45	−24	33	32	+ 1	39	23	+16	41	20	+21
Speeches	16	41	−25	22	23	− 1	16	39	−23	12	34	− 5
Society	9	45	−36	20	20	0	43	9	+34	82	1	+81
Advertisements	8	44	−36	23	16	+ 7	10	29	−19	37	12	+25

munity), the pictorial series of items—Photographs, Comics and Cartoons—heads the list of likes in newspaper subjects and reflects a preponderance of preferred choices at both the high school and college levels. In liaison with this predisposition, Sports and Entertainment (moving pictures, radio, etc.), are given comparable preference although there is somewhat less enthusiasm for Sports on the part of the girls' groups.

Possibly the vicarious zest for adventure is reflected in the indicated preference for Foreign and Travel subjects. It should be noted, however, that high school girls are not so much inclined toward Foreign News as are their college sisters. Because of their more intimate concerns, both sexes of college students—especially the girls—are predisposed to College and Home News. A fairly marked sex difference is reflected in the favorable attitude of the boys towards Scientific News. This sex contrast is, however, somewhat reduced at the college level.

Items including Political Events and Government Affairs apparently do not incur any great impact upon the personalities of high school girls, although the condition is strikingly altered at the college level. War News is likely to gain the attention of high school and college boys.

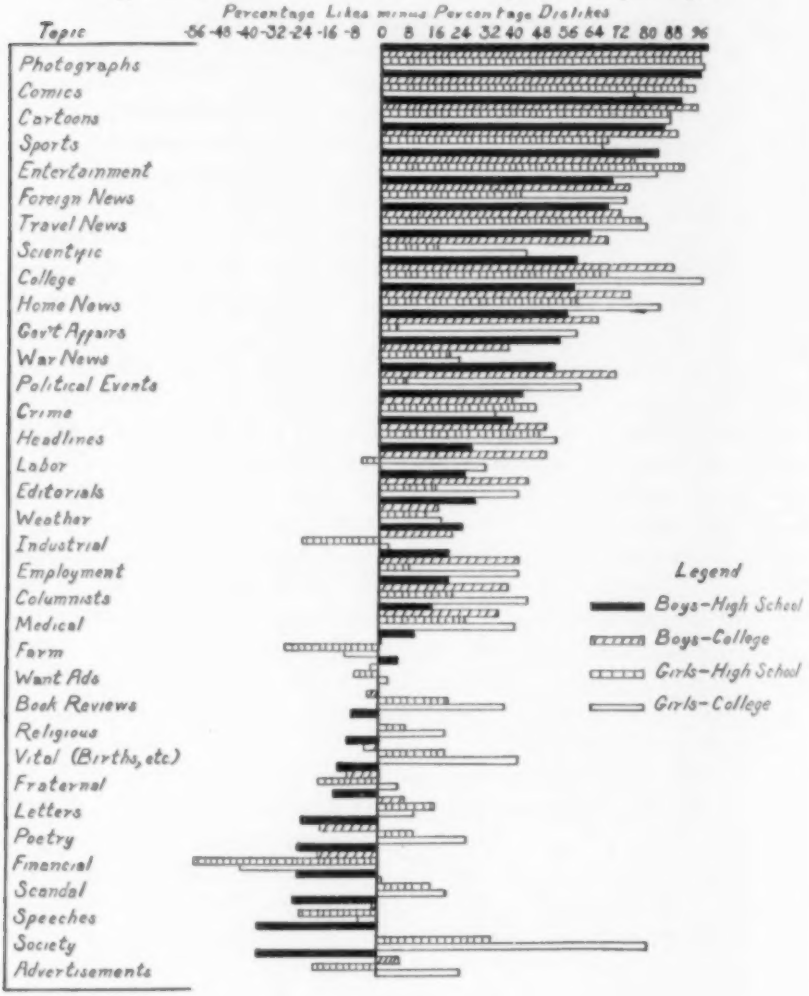
Topics incorporating Labor, Industrial Employment, and Farm News are not particularly relished by this group of high school girls. There appears somewhat increased preference for these topics by college girls and these items (with the exception of Farm News) presumably reflect the impending concern of needs for vocational adjustment. Editorials, Columnists and Medical News seem to be increasingly scanned at the college level. This condition suggests a widening horizon of interest and indicates a differentiating trend already observed for the topics dealing with Political Events and Government Affairs.

The incurred preferences for Book Reviews, Vital News (births, marriages and deaths), Religious Items, Poetry, Scandal, and Society appear to be a sex-associated affair. A majority of these items could well characterize the interests of James' tender minded type. Various conjectures might be made to explain the significance of this trend; undoubtedly numerous impacts emanating from our existing social codes formulate the grounds for this sex differentiation.

Financial News and Speeches appear to be an anathema to both high school and college students. With the exception of college boys, Fraternal News (lodges, clubs, etc.) also appears in the latter category. Advertise-

FIGURE A

Differences between Likes and Dislikes for Newspaper Topics



ments are disliked by high school students, but are given greater preference by college students.

Figure A graphically portrays the data contained in Table I and is presented to simplify the review of the tabulated details.

TOPICS CONSIDERED IMPORTANT

The next problem examines the news topics isolated as important by high school and college student groups when each student was asked to list the most important items from the previous total of 35 subject classifications. Because of the questionable significance of an extended series of choices, only the first three of the eight preferred topics requested will be considered. This arbitrary restriction is justified on the grounds that the first three choices were presumably the most representative of the selected items. Similarly, only those news topics will be reported that designate with sufficient frequency a merited consideration, i.e., 10 percent or more for each topic by either the high school or college groups. A lower incidence would unduly burden the presentation and not introduce any significant positive evidence. Table II reports the summary of newspaper topics regarded as important by high school* and college students. No attempt was made to define the term 'importance' and the instructions were merely to list the items according to their order of importance to the student after he had finished indicating his likes and dislikes for the various topics.

This summary confirms Sports and Comics as most frequently preferred subjects at both the high school and college levels. There is, however, some indication of their waning value for college students, particularly for college girls in the case of Comic preference. In fact, the latter is the most outstanding transformation in the entire summary. Foreign News and Headlines are quite often mentioned as important items by the high school and college groups, but, with the possible exception of some increasing emphasis on Foreign News by college girls, no striking alterations are apparent. News items contained under the general heading of Entertainment (movies, radio, etc.) were considered important reading matter by the high school girls, but relatively insignificant by the college girls as indicated by the drop of 34 percent.

* A slight discrepancy will be noted here in the numbers of high school cases in relation to their appearance in Table I. This difference is due to the failure on the part of these omitted students to designate their preferred newspaper topics.

Political Events, Government Affairs, Photographs and Home News appeared in the second most frequently mentioned aggregate of preferred news topics. (These aggregates—indicated by Roman numerals—were isolated on the basis of relative frequency with which the several news classifications were designated by the several student groups). While high school girls appear little concerned with Political Events and Government Affairs, high school boys are somewhat more partial to these subjects, and there appears a fairly consistent gain in recognition of importance for these topics on the part of the college groups of both sexes. As might be anticipated on a priori grounds, college students are more partial to Home News than high school students. Photograph preference does not appear to be appreciably altered in its estimated importance when considered by the high school or college groups.

TABLE II

MOST IMPORTANT NEWSPAPER TOPICS FOR SECONDARY SCHOOL STUDENTS

(Percentages Indicating Frequency of Choice)

	Newspaper Topic	Percentage of Boys			Percentage of Girls		
		High School	College	Diff.	High School	College	Diff.
		(N = 104) %	(N = 90) %		(N = 94) %	(N = 131) %	
	Sports	58	48	−10	24	15	− 9
	Comics	38	31	− 7	56	17	−39
I.	Foreign News	30	23	− 7	12	23	+11
	Headlines	13	17	+ 4	11	18	+ 7
	Entertainment (Radio, Movies, etc.)	13	12	− 1	44	10	−34
	Political Events	18	28	+10	4	32	+28
	Government Affairs	13	18	+ 5	5	18	+13
II.	Photographs	9	16	+ 7	23	18	− 5
	Home News	6	13	+ 7	16	24	+ 8
	Scientific	16	13	− 3	4	5	+ 1
III.	Cartoons	12	4	− 8	16	7	− 9
	Medical	6	10	+ 4	13	8	− 5
	Crime	16	1	−15	2	5	+ 3
	War News	9	12	+ 3	4	9	+ 5
IV.	Travel	8	3	− 5	12	7	− 5
	Editorials	3	8	+ 5	6	11	+ 5
	College	3	9	+ 6	7	12	+ 5
	Society	1	1	0	5	17	+12

Of the remaining items in Table II other suggestive trends are as follows: (a) Scientific news is apparently of more importance to both high school and college boys than it is to their sex peers. (b) Cartoons appear to be preferred more by high school than college students. (c) Crime News, while considered relatively important by high school boys, is given no great significance by the high school girls or the college students. (d) A gain in

importance of Society News is to be noted on the part of college girls over the high school girls.

Figure B has been included to facilitate the scanning of the quantitative findings in Table II.

FREQUENCY OF NEWSPAPER READING

Another issue which was raised in conjunction with this study dealt with the degree of regularity with which the high school and college groups

FIGURE "B"

Most Preferred Newspaper Topics

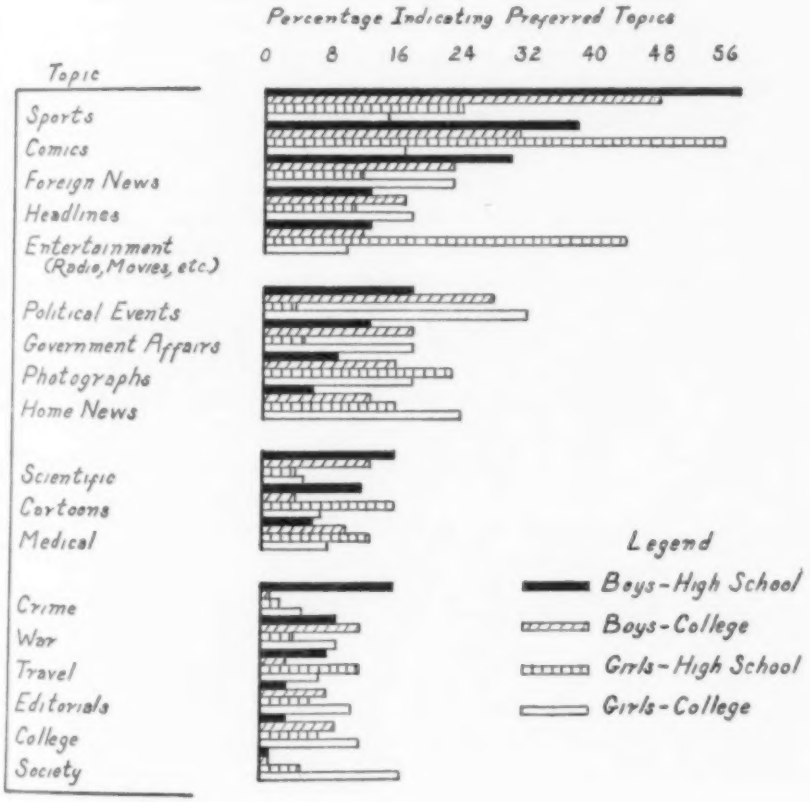


TABLE III

FREQUENCY OF NEWSPAPER READING BY SECONDARY SCHOOL STUDENTS

	Boys		Girls	
	High School	College	High School	College
	(N = 105)	(N = 90)	(N = 97)	(N = 131)
Extremely Regular	55%	48%	64%	37%
Irregular	42%	50%	28%	59%
Very Seldom	3%	2%	8%	4%

read the daily newspaper. Does advanced educational status with its concomitant screening of population alter the frequency of reading habits? Table III presents the results for the several groups.

The reported frequencies indicate that approximately one-half of the high school and college boys read the newspaper with extreme regularity. Among the girls' groups there was some evidence that the high school students were more "newspaper-minded" than their college sisters. Whether this condition would iron itself out with data obtained from larger samplings is an open question. In general, an overview of this evidence indicates there were few instances reporting a 'very seldom' reading of the newspapers. The value of these returns, however, must be judged in light of limitations inherent to all procedures utilizing the questionnaire technique.

SUMMARY

An inquiry has been made regarding the newspaper reading habits of high school and college students residing in a strictly college community. Their likes and dislikes with respect to 35 categories of newspaper topics has been ascertained; the selection of those categories of news that were considered most important to these students was procured; and the frequency of their daily newspaper reading was recorded.

Illustrations and Amusements appear to predominate among the reading interests of both high school and college students. High school girls do not appear to be particularly concerned with news covering politics and government. Labor, Industrial and Farm News are more likely to be disliked than liked by the girls in high school. A sex difference postulating the preference of girls for such topics as Book Reviews, Religion, Vital (births, marriages, etc.) News, Poetry, Scandal, and Society News was found. Speeches and Financial News topics were consistently disliked by high school and college students.

A STUDY OF STUDENT MORTALITY IN A HOME ECONOMICS COLLEGE

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Editor's note: Much work has been done in recent years in the prediction of scholastic success in college. The author presents a report of such a study made of Home Economics students enrolled at Cornell University.

THE increasing popularity of home economics as the college girl's curricular choice has made it seem advisable to begin an investigation of factors predicting success in this field.

Last year the New York State College of Home Economics at Cornell University received four times as many applications as could be accepted. This year there were nearly six times as many. Inquiries have shown that other colleges of home economics are also finding increases in the numbers of applications they receive. The task of evaluating credentials has, therefore, become a very difficult one.

The situation is complicated by a general failure to recognize that the college curriculum in home economics is no less difficult than other courses of study. Home Economics education in the minds of many high school counselors and parents remains the courses in cooking and sewing with which it began, rather than the curriculum in applied science into which it has developed. If a girl can bake cake, her parents and teachers are quite likely to advise her to be a dietitian even though she has difficulty with simple arithmetic. The home economics colleges seem to be in a position similar to that which caused the engineering colleges some years ago to begin a study of what constitutes engineering aptitude as opposed to purely mechanical aptitude.

The present study attempts to investigate the factors influencing student mortality in the New York State College of Home Economics at Cornell, in the hope that the results may be of use not only in evaluating credentials of applicants but in indicating areas in which further study may be profitable.

The subjects were those students of the New York State College of Home Economics who, entering as freshmen with the Classes of '39, '40, '41, had left without completing their college course and who will not return. Equal numbers of students who stood highest and lowest respectively

in these classes were selected for comparison. The groups will be mentioned as the honor group, the poor scholastic group, and the leaving group.

In addition to grades, information available on each student's entrance blank consisted of principal's ratings on various personality traits and high school activities.

Vocational choices, principals' personality ratings and high school activities were studied for each of the three groups. Means for the various high school subjects were computed for each group. The reliability of the means and the reliability of the differences between them were found.

The high school data used in this study are probably a more uniform measure of achievement than is available for colleges using grades of individual high schools because ninety percent of the high school grades here considered are the Regents' grades. Perhaps it should be explained for those not familiar with the New York state secondary schools that examinations are set up by a State Board of Regents and are given in all high schools throughout the state.

Examination of the registrar's records showed that there were 68 students (28% of the original enrollment) who, entering as freshmen with the present sophomore, junior, and senior classes, had left without completing their college course and did not plan to return. The records for ten of these girls, however, were not adequate enough to warrant their inclusion in the study. The leaving group studied consisted of nineteen persons who entered as freshmen with the Class of '39, fifteen who entered as freshmen

TABLE I

VOCATIONAL CHOICE ON ENTRANCE AND REASON FOR LEAVING GIVEN BY STUDENTS WHO IN THE PAST THREE YEARS HAVE FAILED TO COMPLETE THE COURSE IN THE NEW YORK STATE COLLEGE OF HOME ECONOMICS

	Dietetics	Teaching	Undecided	Social work	Clothing	Interior decoration	4-H. ext.
Unknown	2	1	------	1	------	------	------
Job	1	------	2	------	------	1	------
Finances	------	1	2	------	------	------	------
Illness	------	1	1	------	------	------	------
Transferred	1	3	5	------	1	------	------
Dropped (scholastic)	4	2	5	------	1	------	------
Family difficulties	2	------	1	------	------	------	------
Married	8	4	3	1	3	------	1
Total	18	12	19	2	5	1	1

with the Class of '40, and twenty-three who entered as freshmen with the Class of '41. The same number of persons ranking highest in the three classes were selected for the honors group. The same numbers of persons ranking lowest in the three classes were selected for the poor scholastic group. In selecting the honors group and the poor scholastic group only students who entered as freshmen with the Classes of '39, '40, and '41 were considered.

The advisory system of this college makes available information on the individual student which helps to interpret Table I. Investigation of students giving marriage as a reason for leaving was of especial interest. It was found in more than half of the cases that scholastic or financial difficulties in college or family problems preceded the decision to marry. It has also appeared that there have been no difficulties given as a reason for leaving college that have not been encountered by students in the high ranking and low ranking groups. While this statement is based on data gathered by the class counselor working with the student which does not lend itself to objective presentation, evidence is sufficiently strong to suggest that case studies of the three groups would be profitable.

It is interesting to notice that more than half of the leaving group is made up of students whose vocational preferences on entering were listed as dietetics or undecided. While it is generally recognized that lack of vocational focus contributes to poor college performance the question of dietetics is one of particular concern to high school counselors and the admissions committees of home economics colleges. Staff members in this college who work most closely with freshmen find that many students come to college wishing to be dietitians with little understanding of the details of a dietitian's job or the subject matter preparation for it. Scientific aptitude as

TABLE II

VOCATIONAL CHOICES MADE ON ENTRANCE BY STUDENTS WHO HAVE NOT COMPLETED THEIR COLLEGE COURSE AND THE VOCATIONAL CHOICES MADE ON ENTRANCE BY AN ENTIRE CLASS

	Dietetics	Teaching	Undecided	Social work	Clothing	Interior decoration	4-H ext.	Nursing	Nursery school
% leaving group	31	21	32	4	8	2	2	0	0
% Class of '41	29	31	16	4	7	0	5	3	5

well as interest in food preparation is necessary if a girl is to meet the professional standards set up by the American Dietetics Association.

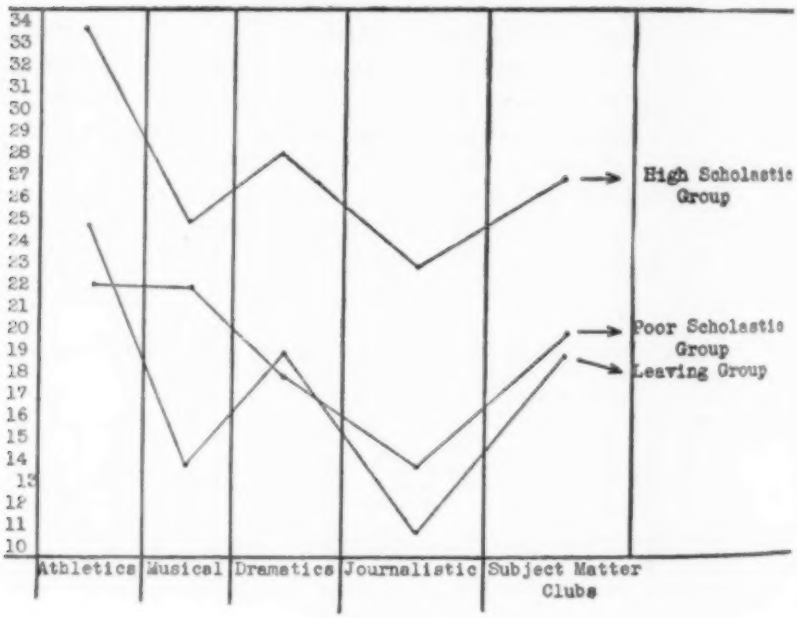
An examination of the vocational choices of the honors group and the poor scholastic group shows that at the time this study was made 45% of the honors group retained the vocational choice made on entrance while 34% of the poor scholastic group did so.

Table II shows how the distribution of vocational preference of the leaving group on entrance compares with the distribution of vocational preferences of an entering class.

The most striking feature of Table II is the fact that while 16% of an entering class listed itself as undecided 32% of the leaving group are classified as undecided. Because a flexible curriculum has been planned to give the student opportunity to explore various subject matter fields it has been found in this college that there is much change in vocational interest

TABLE III

NUMBERS OF STUDENTS FROM HONORS GROUP, POOR SCHOLASTIC GROUP AND LEAVING GROUP PARTICIPATING IN VARIOUS TYPES OF HIGH SCHOOL ACTIVITIES



during the first two years. In consequence, indecision on entrance has not been regarded as important. The above figures suggest that this may not be the case.

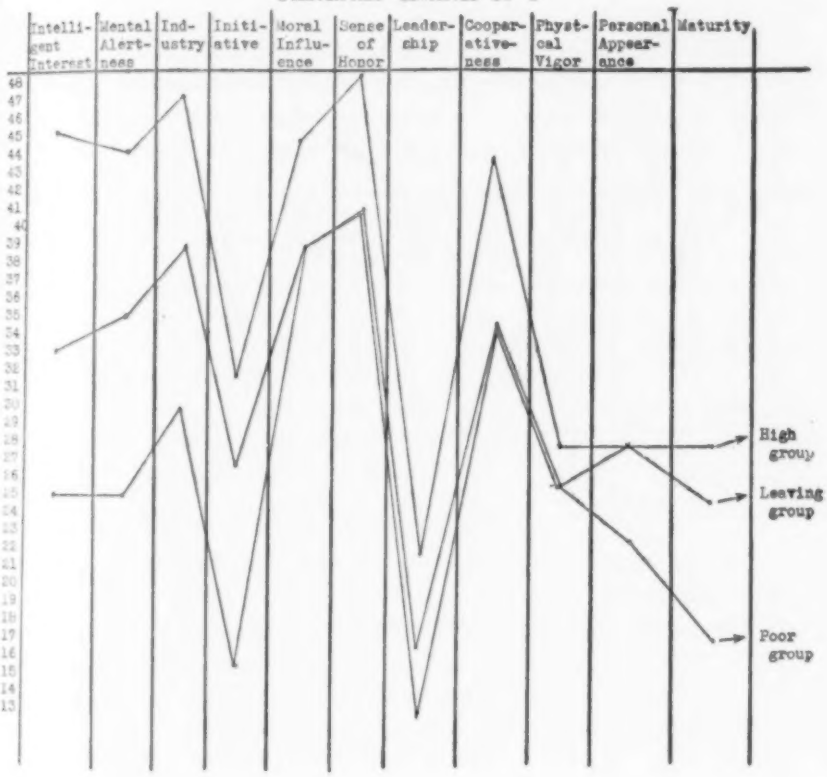
A study of the high school activities of the honors group, of the poor scholastic group and of the leaving group showed that it was possible to divide the activities in five classes: athletic; musical; dramatic, including public speaking and debate; journalistic; and subject matter clubs.

Table III shows the number of students in the three groups reporting participation in the various activities.

The most striking thing in Table III is the marked deficiency in participation in high school activity on the part of the leaving group.

TABLE IV

PRINCIPALS' RATINGS OF 1



The application blank for entrance to this college provides a scale for the principal to rate the applicant on the qualities of intelligent interest, mental alertness, industry, initiative, moral influence, sense of honor, leadership, cooperativeness, physical vigor, personal appearance, and maturity. The ratings may run from one to six. In practice the principals tend to rate the applicants one, two, and three, with a rating of three meaning poor.

Table IV shows the number of students in each group rated one by their high school principals in the qualities listed in the rating scale.

Table IV indicates that the leaving group falls between the low scholastic group and the honors group in the principals' ratings on personality traits. They tend to resemble now the poor scholastic group in the three college classes rather than the honors group. Sharp differentiation among the three groups is apparent only in those qualities which might be inferred from the applicant's academic record.

Means for the general high school average, chemistry, mathematics, English, Latin, modern languages, and social studies, were computed for the three groups.

TABLE V

DIFFERENCES BETWEEN MEANS IN HIGH SCHOOL GRADES FOR STUDENTS LEAVING COLLEGE IN PAST THREE YEARS WITHOUT RECEIVING A DEGREE AND AN EQUAL NUMBER OF STUDENTS RANKING HIGHEST IN THEIR RESPECTIVE CLASSES

Regents Grade in Subject	Mean Honor Group	Mean Leaving Group	Difference	σ diff.	$\frac{D}{\sigma \text{ diff.}}$	Chances true diff. > 0
General Average	89	82	7	1.48	4.7	100 in 100
Chemistry	89	82	7	1.48	4.7	100 in 100
Mathematics	90	85	5	1.27	3.9	100 in 100
English	89	85	4	.097	4.1	100 in 100
Latin	87	84	3	1.29	2.3	99 in 100
Modern Language	88	84	4	1.03	3.9	100 in 100
Social Studies	90	85	5	.97	5.5	100 in 100

Table V shows the differences between the means for the leaving group and the high ranking students.

It is apparent from Table V that there are statistically significant differences between the high school records of the college honor students and those who have left without completing their college course. The greatest difference is shown in Chemistry and the least in Latin.

TABLE VI

DIFFERENCES BETWEEN MEANS IN HIGH SCHOOL GRADES FOR STUDENTS LEAVING COLLEGE IN PAST THREE YEARS WITHOUT RECEIVING A DEGREE AND AN EQUAL NUMBER OF STUDENTS RANKING LOWEST IN THEIR RESPECTIVE CLASSES

Regents Grade in Subject	Mean Low Group	Mean Leaving Group	Diff.	σ diff.	$\frac{D}{\sigma \text{ diff.}}$	Chance in 100 true diff. > 0
General Average	81	82	1	.872	1.15	87
Chemistry	79	82	3	1.74	1.72	96
Mathematics	83	85	2	1.29	1.55	93
English	83	85	2	1.07	1.88	97
Latin	80	84	4	1.28	3.12	100
Modern Language	81	84	3	.93	3.23	100
Social Studies	84	85	1	1.06	.94	83

Table VI shows the differences between the means in the various high school subject matter fields for the leaving group and an equal number of those who are now the low ranking students in the three upper classes.

Table VI shows that only in the cases of Latin and modern languages there are statistically significant differences between the records of those who are now low ranking students in college and those who left without receiving a degree.

CONCLUSIONS

1. More complete information is needed in the high schools on home economics vocations.

2. Considerable similarity exists between the entrance data for the groups who are now the lowest ranking students in their respective classes and those who left without completing their college course.

3. The principals' ratings for the honor group, the leaving group and the poor scholastic group show sharp differentiation only in qualities which may be inferred from the applicant's academic record.

4. The data indicate that a typical student who leaves New York State College of Home Economics without receiving a degree may be described as a girl who on entrance is undecided on a vocation or whose choice is based upon inadequate information. She has probably not taken an active part in high school activities and her regents grades are in the low 80s. The general picture is that of a group which in high school functioned at a much lower level than the group which became the college honor students.

5. There is indication that the case study method might profitably be applied to these three groups or similar groups.

EDITORIAL

THE JOURNAL OF EDUCATIONAL RESEARCH AS A SOURCE OF EVALUATIVE TECHNIQUES

MUCH is said and written these days about evaluation in education. This movement is most important for many reasons, but especially because of the new techniques that it has produced and the orientation provided the whole measurement movement. Reports of these new techniques will be found in various monographs and periodicals. The *Journal of Educational Research* has been anxious to help and has published many reports containing evaluative techniques of various sorts. It has been anxious that such instruments as have been suggested be well grounded and carefully validated.

One of the most stimulating of the papers recently published in the *Journal* is that by Morey, "Basic Needs of Man in Society," published in the September issue. This paper is significant in that it attempts to provide an objective orientation for efforts at evaluation and a point of departure for a long list of needed investigations. There are a number of other papers in this issue suggesting and using evaluative techniques: Zeleny reports a study of the relationship between participation in group discussions and personality changes; Hill and Trent report upon children's interests in comic strips and from an analysis of comics most frequently read offer important suggestions relative to the reading interests of children. In the field of the school subjects Brueckner offers a discussion of readiness tests in arithmetic.

It will not be possible to refer to all of the papers published in these recent issues of the *Journal*. Readers interested in general evaluative techniques should be interested in articles by Good, "Methods of Research and Problem Solving" (October issue), and by Scates, "Assumptions Underlying Research Data" (December issue); and in editorials by Barr, "Choice and Validation of Educational Techniques" (October issue); by Symonds, "Trends in Educational Research" (December issue); by Barr, "On the Use of Anecdotal Records" (January issue); and by Osburn, "Current Needs in Educational Research" (January issue). Freeman offers a good discussion of

an important aspect of the financing of educational research in his paper on "Cooperative Research with Adequate Support" in the January issue.

For those primarily interested in the more technical sort of paper, the *Journal* offers a paper by Seder on the "Reliability and Validity of the American Council Psychological Examination, 1938 Edition," (October issue); by Scates on "Deriving and Economic Index for American Cities" (October issue); by Amis on "An Analysis of Averages Involved in Broken Trends in the Cross-Tabulation Process" (January issue); and by Drake on "The Iota Function" (November issue).

Persons particularly interested in the New Education and non academic outcomes should find these papers worth while: Hoff, "A Study of the Honesty and Accuracy Found in Pupil Checking of Examination Papers" (October issue); Lamson, "Do Children Who Participate in a Rich Vital School Curriculum Achieve Greater Control Over School Subjects Than Do Children Who Pursue a Formal Curriculum?" (November issue); Wrenn and Crandall, "Behavior Ratings and Scholarship Among College Freshmen" (December issue); Brookover, "Person-Person Interaction Between Teachers and Pupils and Teaching Effectiveness" (December issue); Donner, "A Survey of Students' Concepts Concerning Lost and Found Property" (December issue); Mitchell, "Do Scales for Measuring Attitudes Have Any Significance?" (February issue); Epstein, "Attitudinal Changes Attendant Upon Variation in Experience" (February issue); and Baker, "The Fetish of Statistics" (February issue).

Field workers will find a long list of papers chosen with their needs particularly in mind: Gray, "Summary of Reading Investigations" (February issue); Fahey and Waller, "An Experimental Investigation of the Effectiveness of Certain Diagnostic and Guidance Procedures When Applied in Cases of Low School Achievement" (January issue); Grossnickle, "Comparison of Achievement of Pupils Who Are Good and Poor in Learning Division With a Two-Figure Divisor" (January issue); Davis and Laslett, "A Study of the Educational Status and Some Educational Implications of a Local Relief Population (December issue); von Eschen, "An Evaluation of a Secondary School Course in 'Contemporary Problems' from Certain Stated Points of View" (December issue); Spache, "Characteristic Errors of Good and Poor Spellers" (November issue); Johnson, "Standards for Graduation from Secondary Schools" (November issue); Green, "A Study of Typewriting Achievement in Three High Schools" (November issue); Rodgers,

"Comparison of School Achievement of High-School Pupils Who Had Part-Time Employment with Averages of Their Respective Groups" (October issue); Finch and Nemzek, "Attendance and Achievement in Secondary School" (October issue); and Berglund-Gray and Young, "The Effect of Process Sequence on the Interpretation of Two-Step Problems in Arithmetic" (September issue).

Besides these there are many others relating to other important aspects of education. This editorial was prompted by the thought that many persons were not well acquainted of the very large amount of pertinent materials available in the various issues of the *Journal*.

A. S. BARR.

REVIEWS

Address all communications relative to book reviews to Editor Kai Jensen, University of Wisconsin, Madison, Wisconsin.

WASHBURNE, CARLETON. *A Living Philosophy of Education* (New York: The John Day Company, 1940), pp. xxi + 585. $4.00.

In these days of dramatic world events and the ever-intensifying problem of how schools should be adjusted to them, it is refreshing and helpful to read a straightforward account of what a progressive educator is actually doing in a real school system where the conditions are not too remote from the typical. Superintendent Carleton Washburne has given us such an account in his new book, "A Living Philosophy of Education". The title may be somewhat misleading to those who define philosophy in terms of an analysis and criticism of basic assumptions. The author makes very clear from the outset, however, his point of view by beginning with the quotation: "Whenever, in the course of any activity whatsoever, we stop to consider as explicitly as we can *what* it is that we are doing, *how* we are doing it, and *why*, that act of considering is philosophy". The book is a thoughtful and interpretative presentation of the work of the schools of Winnetka, Illinois, by the one who, more than any other, has given them a place in any deliberation concerning the broad meaning of modern education.

The keynote of the book is expressed in the statement: "the whole school should be organized in terms of satisfying the child's basic needs". (Page 47). Through a clear and well-developed organization of his materials, the author presents in much detail the needs of the child, first, his physical needs as a person, mental and emotional as well as somatic. Then his needs as an individual, expressive, vocational, leisure time, etc., are dealt with. The third section discusses the child's relation to the means of social relationships which are interpreted in terms both of common skills and also of the social studies. The book rises to a climax in the fourth section where the child is considered as an integral part of an organic society and social consciousness is discussed at length. The final section deals with those aspects of school administration which attempt to conform to the democratic ideal.

In each section throughout the entire book, the basic assumptions are presented and then the controversial positions with reference to them are discussed. The book is unique in that the position is accepted which experience in the life and work of the author has proved advantageous, as he sees it, in meeting the needs of children. While reference is made occasionally to authoritative thinkers, on the whole the book is strikingly free from dependence upon the thinking of others and the usual apparatus of notes, etc., one has come to associate with scholarly works. It is also rather amazing how the

author succeeds in bringing in at one point or another about all the debated topics of present day education: indoctrination, child need vs. wish, controversial problems in the social studies, integration, and a host of others, and leaving each with suggestions which are sane, balanced, and never extreme in one direction or another. A great wealth of actual procedures and solutions to difficult situations is given.

The book is difficult to criticise as the answer to any objection: "It worked in experience to the advantage of the children", is always very hard to meet. One might raise several questions, however. It is true that school procedures should doubtless begin with the needs of this particular child or this group of children. But since the wish or immediate desire may not be depended upon to give the clue, how does one determine the needs? The answer would seem to be found in the aesthetic and ethical norms developed within the larger social group, rather than in the nature of the individual child. If one accepts this answer, then, does it require him to swing from the one extreme of the nature of the child to the other of a common body of subject matter to be learned as the basis of educative content? May there not be a third position which stresses the social or common element, but dynamically rather than the static, that is, the common activities and desires of the larger group as over against their common knowledge? Following another train of thought, may not one ask how, granting the need of building a social consciousness in the mind of the child, the needed reconstruction of the social order itself may be brought about? Is the slow and long drawn out making of the mind of the individual child the best one can do? The author is aware of these problems, but the reader is doubtless somewhat confused by the title of the book which would lead him to expect the solution of such problems as these to precede a discussion of procedures in a book called a philosophy.

On the whole the book is written attractively in a free and informal style that holds interest. It should be of especial value to a foreigner asking about modern American education at its best, to young students who are attempting to get at the working of the theories which they have read in more abstract form, and to anyone who wishes a broad and thoughtful view of a living and progressing school system.

MERRITT M. THOMPSON.
University of Southern California

WILLIAMSON, E. G. and HAHN, M. E. *Introduction to High School Counseling* (New York: McGraw–Hill Book Company, Inc., 1940), pp. ix + 314. $3.00.

This is another book in the series of valuable contributions to the field of guidance and personnel that has come from the University of Minnesota. There is more or less of a continuity running through them due in large part, one would suppose, to the influence of one of the authors, Williamson, who has written one and collaborated in each of the others. In the opinion of many, the best of the series is the one Williamson has himself written, "How to Counsel Students". "Introduction to High School Counseling" seems to be largely a condensation of "How to Counsel Students" and an attempt to suit the material more definitely to the needs of high school counselors.

The effort to condense has in many cases reduced the effectiveness of the presentation by omitting much of the supporting evidence and arguments. In many places the book is not well organized and somewhat confused in its expression. It gives evidence of being hastily written. The preface is especially confused and fails to give the reader any clear idea of the difference, if any, between counseling and good teaching, and guidance and good teaching. The authors say that counseling is a "face to face meeting of two representations from different generations for the purpose of helping the younger generation to help themselves". This would at once rule out any "face to face" meeting between two adults as counseling and would deny that "face to face" meetings between teacher and pupil regarding the learning process is counseling, although later, in chapter 6, it is called counseling. The same lack of clarity is seen in the discussion of "personnel worker". In one place it would seem that any teacher or other worker who uses personnel methods is a personnel worker: in another a personnel worker seems to be a specially trained person who gives all or most of his time in counseling and other activities concerned with helping students in types of problems not definitely related to teaching. The term "guidance" is studiously avoided but the term "personnel worker" as used is even more confusing.

Two tendencies seen in previous books in the general series are apparent here. One is the questionable method of setting up a straw man and demolishing him or of exaggerating or overemphasizing one point of view in order to bring out another. The other tendency, somewhat reduced, we are glad to say, is the reliance upon tests as adequate bases for the discovering of abilities, interests, and other characteristics. If this tendency but continues the authors will soon be on a really sound basis in relation to tests. One cannot help feeling that the clinical method advocated so strongly here is, with all its undoubted values, somewhat overemphasized.

These comments and criticisms, while they indicate points that are confusing and disturbing, are minor and should not be taken as evidence of lack of value. There is much to commend in the treatment, and counselors as well as administrators and teachers will find the book as a whole very helpful. Chief among the excellent points may be mentioned the following: 1) The insistence on the unity of guidance, that problems of individuals cannot be separated into their elements—vocational, educative, personal, emotional—but must be treated as complex wholes. 2) The clear conception that the entire school staff must be concerned with the guidance of youth, that this service must be a cooperative, coordinated service. 3) The statement that all members of the school staff need special training in order to function properly in the program. One very interesting and valuable feature is the description of cases given in different chapters to illustrate the principles discussed.

The style is, for the most part, clear and interesting and the references abundant and well chosen. It is, taken as a whole, a valuable addition to our rapidly increasing library on counseling and guidance.

ARTHUR K. JONES.
University of Pennsylvania

TRAXLER, ARTHUR E., Editor. *Guidance in Public Secondary Schools: A Report of the Public School Demonstration Project in Educational Guidance* (New York: Educational Records Bureau, 1939), pp. xxv + 329. $2.50.

The Educational Records Bureau, under the able leadership of Ben D. Wood, has made many valuable contributions to education. One of the best of these is the Public School Demonstrations Project in Educational Guidance. This book is a detailed report of this demonstration. The project was made possible by a subvention from the Carnegie Foundation for the Advancement of Teaching and while originally intended to cover a period of three years, was, by clever planning, extended to five years.

Some such educational experiments as those aided by grants from foundations, have been of very doubtful value either because the conditions under which the experiment was conducted were artificial and did not represent a situation that was representative or because the school could not continue the plan after the subvention was withdrawn and after the specialists were no longer available. This project, in large measure, avoided both of these dangers. It was a cooperative plan involving partial support by the seven local schools and utilizing the school personnel; it also provided for a gradual withdrawal both of financial aid and of expert outside assistance. From reports regarding the present activities of the schools concerned the project had a marked stimulating and permanent effect upon their work.

The demonstration was based upon a thoroughly sound and acceptable philosophy of guidance which stresses the need for 1) an understanding of the abilities and interests of and by the individual, 2) the need for the development of life goals with reference to these abilities and interests, and 3) a gradual development of "complete and mature self-guidance".

The purpose of the project is described under five heads: 1) Maintenance of cumulative records, 2) Systematic use of comparable tests, 3) Development and observance of a system of continuous teacher education, 4) Study of the relationship between curriculum requirements and individual needs, 5) Improvement in procedures for marking pupils and reporting their progress to parents.

More attention is given to reporting the use of different kinds of cumulative records than to any other division. This is in accord with the belief expressed in the preface that "the first duty of the school is to know its pupils as individuals". The report of five years of guidance in the high school at Plainfield, N. J. is very interesting and revealing.

The testing program naturally receives much emphasis. This is to be expected since the editor and the other outside specialists apparently accept as true the questionable statement that "Experience indicates that objective achievement-tests are the most important of all tests in a guidance program." It would seem that, in spite of the generally accepted principle that one cannot arrive at a valid understanding of individual abilities and interests by analysis and exact measurements, the authors still cling to the idea that since standardized achievement tests are relatively objective and both valid and reliable for what they measure that therefore they are valid and reliable for measuring the abilities of a total functioning individual.

The chapter on the use of the anecdotal record is very helpful in showing what sort of items should go into these records and of how the reporting can be done. This is also true of the chapter on the use of case studies in guidance. One of the most important contributions is the emphasis upon in-teacher training in guidance. One may well question the effectiveness of the type of inservice training that is reported, at least for other situations, but the insistence upon this as an important element in the improvement of the guidance program is timely and cannot be too strongly emphasized. While the report is intended to be confined to the secondary school an effort is made to show the need for guidance in the elementary school. This part is disappointing and makes little contribution to the effectiveness of the report.

One of the most valuable parts of the entire report are the conclusions regarding the elements that are basic to a good guidance program. These may be briefly stated as follows: 1) "The success of the school in developing an adequate guidance program is closely proportional to the interest and perseverance of the higher administrative officers in the school or school system". 2) "The success of the guidance program is closely proportional to the effectiveness of the teacher re-education program." 3) "The continuing effective functioning of the guidance program depends upon the maintenance in conveniently usable form of cumulative records of comparable test measures and of data on personal development, self-discipline, and social adjustment of individual pupils." 4) "The traditional academic curriculum is too narrow to care for the educational needs of all the pupils now in the secondary schools".

The report as a whole is well written, practical, and very stimulating. It deserves wide publicity and should be one of the "must" books in every professional school library.

ARTHUR K. JONES.
University of Pennsylvania

KOOS, LEONARD V., HUGHES, JAMES M., HUTSON, PERCIVAL W., and REAVIS, WILLIAM C. *Administering the Secondary School* (New York: American Book Company, 1940), pp. xii +678. $3.25.

The impressive authorship of this book predisposes the reader to confidence in the text, a confidence which he will retain as he reads. While this is a large book, the authors frankly and wisely limit the scope to the general phases of secondary school administration, and do not attempt to include full treatment of such special topics as guidance and curriculum building.

The first chapter deals with the scope and function of administration; the remainder of the book is organized into a series of discussions of standard managerial problems. The successive chapters treat the administration of the Program of Studies, the Vocational Program, the Health Program, the Extra-curriculum, the Guidance Program, the Program for Individual Differences, the School Schedule, the Selection of Teachers, the Adjustment of the Teaching Load, the Salary Problem, the Personnel, the Buildings and Grounds, the Equipment and Supplies, the Office Routine, the Finance, and the Community Relations.

The book does not overlook the complexity and variety of school organizations in America. In its descriptions of practice it covers large and small schools,

senior high schools, junior high schools, and six-year high schools. Pedagogically, it is well-constructed, with a careful analysis of educational literature from the point of view of the secondary school administrator (pp. 9–12), and, at the end of each chapter, selected bibliographical references and a list of "questions, problems, and investigations". The emphasis upon periodical literature is commendable in that it is upon the magazines that the live principal will have to depend for news of recent experiments and innovations.

As to whether he approves certain omissions, the user of the book will have to make up his own mind on the basis of his own purposes. The authors decline to be prophetic, and in their discussion of "trends" (pp. 14–17) pay little attention to the events of the last decade. In evaluating the traditional pattern of studies for college entrance, (pp. 18–22) while certain brief studies are mentioned, the clear-cut and extraordinarily reliable evidence from the Thirty-School Experiment is ignored. In the chapter on curriculum (Chapter II) the interesting departures of the Thirty Schools could be used as examples. The same is true of the publications of the North Central Association, the Curriculum Commission of the Progressive Education Association, and certain California schools. The work of the Committee on Orientation of Secondary Education, and that on Implementation, of the National Association of Secondary School Principals, has an important bearing on high school administration in the future; so, also, has the work of the National Youth Commission.

The chief value of the book lies in the clearness and reliability of its statements about established practices. In harmony with the author's evident purpose, no pervasive, consistent philosophy of education is worked out; the treatment is realistic and dispassionate. As a text and a reference book for classes in secondary school administration it has a solid value which will endure beyond the usual life-span of books on education.

HEBER HINDS RYAN.
New Jersey State Teachers College at Montclair

WERNER, HEINZ; GARSIDE, E. B., Translator; ALLPORT, GORDON W., Foreword. *Comparative Psychology of Mental Development* (New York: Harper and Brothers Publishers, 1940), pp. xii + 510. $4.00.

The *Comparative Psychology of Mental Development* is a welcome, readable, and highly useful book. In reading it I started marking passages for review purposes, but soon found that most of my notes were for classroom and personal use. There are stimulating ideas and useful illustrations for a wide range of psychological topics.

The entire book consists of a detailed description of primitive mental activity—the perceptual, ideational, and affective experiences of children, some psychotics, and ethnologically primitive man. Primitive mental life differs from more sophisticated varieties, Werner writes, in being less abstract, less well analyzed, closer to concrete reality, and more dependent on the total situation in which it occurs. These distinctions are not quantitative ones; there is no continuum connecting primitive thinking with higher levels of thinking. On the contrary, the important aspect of each level is its total pattern and these patterns are qualita-

tively distinct. As evidence in support of these distinctions Werner offers a few experiments and a great many illustrations drawn from clinical, biographical, and anthropological observations. Much of the work cited is from European sources.

One can describe different levels of mental activity without answering the purely developmental questions of how one advances from one level to another. This is just what Werner does. His discussion of the problems of development specifically denies the concepts of evolutionary psychology, and rejects the hypothesis of a "purely quantitative increase in the logical capacities of a man as he moves toward a norm of mentality represented by the western world" (14). In place of these explanations Werner insists that development "must be thought of in the form of typical mental patterns, with the relatively higher levels being understood as innovations emerging from the lower" (15). But, how do these innovations develop? How do they emerge? These problems are as important for a complete psychology of mental development as are the problems of description of the different levels. Werner gives no adequate answers to them.

In some cases development is in the wrong direction. Much thinking of schizophrenics and asphasiacs resembles that of the more truly primitive groups. This dropping to a lower level is by no means unknown in normal adults. As Allport points out in the Foreword, "While tactfully confining himself to children, primitives, and psychotics, the author tells us in a sly way more than a little about our own mental lives."

DAEL WOLFLE.
The University of Chicago

WILLIAMS, K. P.; BENNETT, A. A.; BUCHANAN, H. E.; GRIFFIN, F. L.; HUTCHINSON, C. A.; MACNEISH, H. F.; MITCHELL, U. G.; BETZ, WILLIAM; HARTUNG, M. L.; JAMISON, G. H.; LANE, RUTH; NYBERG, J. A.; POTTER, MARY A.; and REEVE, W. D. *The Place of Mathematics in Secondary Education*. (New York: Bureau of Publications, Teachers College, Columbia University, 1940), pp. xvi + 253. $1.25.

This is a report of the Joint Commission of the Mathematical Association of America and the National Council of Teachers of Mathematics, organized in 1935 specifically to prepare such a report. It is concisely written, in semi-outline form. The commission addresses itself to all those, teachers, administrators, and educationists in general, who are interested in education through mathematics.

A short discussion on the "role of mathematics in civilization" gives noticeable emphasis on mathematics as an "outgrowth of human needs" and as a "mode of thinking". The basis for the recommendations of the report is a consideration of modern education and its general aims as a constant readjustment to changing conditions. A personal, psychological point of view is assumed in discussing certain general objectives of secondary education. The emphasis is clearly indicated by such activities under clear thinking as gathering, organizing, representing, and interpreting data; establishing and judging claims of proof, using and applying skills, information, concepts, and general principles.

The problem of indicating the manner in which mathematics as a school subject should contribute to the aims of educa-

tion for all, is simplified by the manner in which those aims are discussed. Two points which need constant emphasis and implementation are introduced here: the need for (1) fundamental understanding as obtained through an experiencial approach, and (2) more specific attention by the teacher to objectives with more general implications. Skills and techniques which, in themselves, tax the pupil's ability cannot be expected to function in a variety of situations.

In approaching the problem of curriculum construction, the commission emphasizes two fundamental assumptions: (1) the education process is a continuous one; (2) any recommendations must have sufficient flexibility to be useful in a variety of administrative organizations. Mathematics cannot make its contributions adequately if offered in a disconnected sequence of isolated units. ". . . Its central themes and its broad life values must be given an opportunity to unfold gradually and continuously in harmony with known facts of mental growth".

As a basis for the building of a curriculum, the commission gives two principles of classification. First there is a subdivision according to major subject fields—the field of: I—Number and computation; II—Geometric form and space perception; III—Graphic representation; IV—Elementary analysis; V—Logical (or "straight") thinking; VI—Relational thinking; VII—Symbolic representation and thinking. Second, there is a subdivision of the fields into categories such as the following: I—Basic concepts, principles, and terms; II—Fundamental processes; III—Fundamental relations; IV—Skills and techniques; V—Applications. A summary of these fields in outline form offers a convenient source for suggestions.

The report gives two alternative plans for the distribution and organization of materials of instruction for grades 7–12. The second of these seems to place more emphasis on the needs of the "non-college" student in the opinion of its proponents. However, it is challenging to read: "The basic mathematical work in any school year, for pupils of approximately the same ability, should be the same for those who expect to enter vocational fields in the near future and for those who will have an opportunity to extend their training through further academic work."

Chapters are included giving suggestions as to differentiation of curricula for individual differences, a program for the junior college, new methods of evaluation, and plans for teacher education. Many will find very useful the material of the appendix giving an analysis of mathematical needs, a glossary of terms, symbols and abbreviations in elementary mathematics, suggestions for equipment of the mathematics class room, a grade placement chart, and a short treatment of the question of transfer of training.

The report attempts to draw from current practice that which the commission feels is worthy of recommendation and to set up a program which is at once forward looking and practicable for all schools. Although it leaves much to the ingenuity and resourcefulness of the teacher, its recommendations are sufficiently specific to crystallize many present trends. It is frankly a statement of the consensus of opinion of the group based partially on considerable suggestion and criticism by many interested individuals.

PAUL L. TRUMP.
University of Wisconsin

GRABBE, PAUL. *We Call It Human Nature* (New York: Harper & Brothers, Publishers, 1939), 120 pp. $2.50. (College Text book—$1.75).

When friends ask "What is a good book on psychology that even I can understand?" give them *We Call It Human Nature*. The combination of Gardner Murphy's scholarship "to make this book authentic, factual, accurate" and Paul Grabbe's skill at reducing psychological complexities to common everyday language has resulted in a first rate popular psychology. The dozens of well-chosen photographs, skillfully drawn diagrams, and delightful sketches complement and vitalize a text which gives rapid synoptic treatment to most of the traditional psychological problems.

The teacher of elementary psychology may prefer to use a text which his students will not read through on the first day. But if he keeps *We Call It Human Nature* from the students, he ought to study it himself. There are many useful ideas on style, illustrations, and teaching techniques that his students will appreciate.

DAEL WOLFLE.

The University of Chicago

VALENTINE, C. W. *An Introduction to Experimental Psychology* (London: University Tutorial Press, Ltd., 1939), pp. x + 283.

Valentine's experiments are intended particularly for students interested in educational psychology, but many of them are quite suitable for any beginning course in psychology and can be used for lecture demonstrations as readily as in individual experimentation. With few exceptions the experiments are easily understood, quickly completed, and require no apparatus except pencil and paper.

There are 53 experiments classified into 22 topics. Two chapters are devoted to each topic. The chapter in Part I gives directions; the parallel chapter in Part II provides a brief background for understanding the problems involved and offers suggestions for the educational use of the methods outlined in Part I.

The third edition differs from the second in including "new chapters on the Accuracy of Report and Suggestion, Perception, Apperception and Imagination, Intuitive Judgments of Character or Disposition; and new experiments on Memory, Attention and the Testing of Aesthetic Appreciation. The bibliography has been considerably extended" (viii).

DAEL WOLFLE.

The University of Chicago

Research Abstracts and Bibliographies

Address all communications relative to research abstracts and bibliographies to A. S. Barr, University of Wisconsin, Madison, Wisconsin.

BULLETINS

ENGELBART, E. H., Chairman, and others. *Pupil Personnel Study of Pupils in Minnesota Public Schools,* Part III (St. Paul: Minnesota State Department of Education, 1940), Mimeographed. Section 1. *Pupils Selected as Dull and Mentally Sluggish by their Teachers Contrasted with Those Selected as Original, Independent Thinkers,* 46 pp. Section 2. *Relation Between the Pupils Rate of Comprehension of Reading and His Adjustment and Progress in School,* 59 pp. Section 3. *Persistence of Problem Case Tendencies from the Fifth and Sixth Grades to the Seventh and Eighth Grades,* 59 pp. Section 4. *Good and Poor Achievers in School Work Contrasted For Gains in Attainment, Changes in Quality of Work and Personality Indices,* 58 pp. Section 5. *Relation of Teachers Ratings on Traits and Groups of Traits to Gains in Total Attainment over a Two Year Period,* 54 pp. Section 6. *Relation of Mental Indices, Initial Attainment Scores, Grade Progress, and Problem Case Selections to Gains in Total Attainment over a Two Year Period,* 39 pp.

A series of pupil personnel studies representing up to date practices in this area with representative results.

GANDERS, HARRY S., and others. *A Functional Program of Teacher Education* (Washington, D. C.: American Council on Education, 1941), 259 pp.

The Commission on Teacher Education presents a description of an attempt at Syracuse University to provide a functional program for the training of teachers.

GRANT, ALBERT, and LAMPKIN, RICHARD H. *Results of Cincinnati Health Knowledge Test Given in Grades VIII and X During January 1941* (Cincinnati: Cincinnati Public Schools, 1941), 8 pp. Mimeographed.

A mimeographed bulletin in which the authors present an item analysis of the responses of 8th and 10th grade students of a Health Knowledge test administered in the Cincinnati Public Schools.

MONES, LEON, Editor. *The Library as a School Function and Activity* (Newark: New Jersey Secondary School Teachers' Association, 1940), 87 pp.

The author presents a descriptive study of the library in the new school and its functional interrelationship.

SEAY, MAURICE F., and CLARK, HAROLD F. *The School Curriculum and Economic Improvement,* Bulletin of the Bureau of School Service, XIII, No. 1

(Lexington, Kentucky: University of Kentucky, September, 1940), 119 pp.

A progress report made at the end of the first year of an experimental study of applied economics particularly in the area of health instruction.

SMITH, HENRY LESTER, and EATON, MERRIL T. *An Analysis of the Achievement of 164 Sophomores Enrolled in Teacher-Training Courses at Indiana University,* Bulletin of the School of Education Indiana University, XVII, No. 1 (Bloomington, Indiana: Bureau of Cooperative Research, Indiana University, January, 1941), 28 pp.

The authors present an analysis of the achievement of students enrolled in teacher training courses based upon tests, grades, and other data. Students enrolled in teacher training courses seemed to fare less well than liberal arts students not enrolled in teacher training courses.

REMMERS, H. H., Ed., and others. *Studies of Extracurricular Activities I,* Studies in Higher Education XXXIX (Lafayette, Indiana: Division of Educational Reference, Purdue University, December, 1940), 30 pp.

The authors present the results of two studies of the effects of participation in extracurricular activities.

RYANS, DAVID G. *The First Step in Guidance: Self-Appraisal,* A Report of the 1940 Sophomore Testing Program (New York: Cooperative Test Service, American Council on Education, January, 1941), 35 pp.

The author presents an analysis and norms based upon the Ninth Sophomore Testing Program. A study of self-rating shows that most students are poor judges of themselves.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

KINNEMAN, JOHN A., and SHELTON, RUSSELL S. "High-School Communities in an Area of Declining Population," *School Review,* XLIX (February, 1941), pp. 114–122.

The authors present an analysis of the size of the school districts and other factors influencing the school service in a community of declining population.

PSYCHOLOGY OF LEARNING AND TEACHING

MANEVAL, ROY V. "The Relative Value of Sound and Silent Motion Pictures in Science Teaching," *Science Education,* XXIV (December, 1940), pp. 361–364.

The author presents the results of an experimental study of the relative merit of sound and silent motion pictures in which he finds no statistically significant difference. Higher IQ pupils seem to do better with silent pictures and low IQ groups do better with sound pictures.

PUPIL GUIDANCE, WELFARE AND DEVELOPMENT

SUPER, DONALD E., and WRIGHT, ROBERT D. "From School to Work in the Depression Years. II," School Review, XLIX (February, 1941), pp. 123–130.

This is the first of two articles reporting the results of a study of the problems arising in transition from school to work.

Research News and Communications

Address all research news and communications to Carter V. Good, Teachers College, University of Cincinnati, Cincinnati, Ohio.

Yearbooks of the American Association of School Administrators, N. E. A.—At this time there are three yearbooks in various stages of development, as described below by Frank W. Hubbard, director of the N. E. A. Division of Research.

The yearbook for 1941, *Education for Family Life*, under the direction of E. W. Jacobsen, dean, School of Education, University of Pittsburgh (former superintendent of schools in Oakland, California) represents a compact volume of 368 pages. Completed copies were forwarded early in February to members of the Department. An effort has been made to analyze the contribution of the family to American life and to show at what points and in what general way schools can exert a constructive influence upon the home. Little attempt has been made to outline specific procedures and elaborate devices. The emphasis is rather upon principles and processes. Membership of the yearbook commission includes: Carol Ryrie Brink, Lawrence K. Frank, Ernest R. Groves, Kate W. Kinyon, Gertrude Laws, DeWitt S. Morgan, Flora M. Thurston, and Worcester Warren.

Early in February, 1942, the yearbook commission, under the direction of John L. Bracken, superintendent of schools in Clayton, Missouri, expects to present its report on *Health Education*. Attention will be given to what needs to be taught in health education in elementary and secondary schools, health guidance, the use of special classes, the provision of a healthful school environment, the effect of various kinds of state and federal legislation, the coordination of community agencies, mental hygiene, the health instruction contribution of various areas of the curriculum, and the function of the superintendent of schools in coordinating the program. Membership of the commission includes: W. W. Bauer, Margaret Bell, Robert G. Bernreuter, John E. Burke, A. C. Flora, William J. Hamilton, Daniel J. Kelly, Bernice Moss, C. E. Turner, and Charles C. Wilson.

The general topic for 1943 has to do with the problems of adjustment after leaving school. The yearbook commission to prepare this study has not yet been appointed.

Elementary Principals' Yearbook.—The Nineteenth (1940) Yearbook of the Department of Elementary School Principals is entitled *Meeting Special Needs of the Individual Child*, and is described below by Richard R. Foster, assistant director of the N. E. A. Division of Research. This report is based on the principle that equality of educational opportunity requires not the same school program for all children but a variety of programs which are equally suited to

the characteristics and needs of different children. The ten chapters are concerned with the nature and educational implications of individual differences in mental abilities; principles and techniques of child study; comprehensive school programs of individual guidance; provisions for individual needs in heterogeneous classes; provisions for children of superior ability, for those who are slow to learn and retarded in school, for those who are physically handicapped, for those who have cultural and economic handicaps, and for those with personality problems; and general administrative and supervisory practices for meeting individual differences. Each chapter except the first consists of several independent articles by different authors, there being a total of fifty-two separate contributions. Each chapter is followed by a list of carefully chosen references for further reading.

Most of the yearbook is devoted to descriptions of practices in particular schools by principals, supervisors, and teachers. Other sections were contributed by such specialists as Frank S. Freeman, C. H. McCloy, David Segel, Ruth Strang, Willard C. Olson, Ruth Streitz, Ethel Kawin, Cora L. Danielson, Arthur I. Gates, and Harry J. Baker. These authors recognize that children have important needs in common—that the general objectives of education should be the same for all children. They contend, however, that the extent to which these objectives can be attained and the best means of attaining them will vary according to the capacities, interests, past experiences, present environment, physical condition, and personality traits of each child. In stressing methods of discovering and meeting the special needs of individual children, the book does not ignore the common needs of all children; rather, it focuses attention on the necessity for meeting common needs in accordance with the varied characteristics of individuals.

Research Encyclopedia.—The Encyclopedia of Educational Research was scheduled for February publication by Macmillan Co. It has been edited by W. S. Monroe of the University of Illinois, with the sponsorship of the American Educational Research Association. The afternoon program of the Association at Atlantic City on last February 24 was devoted primarily to the Encyclopedia. It is a one-volume work of 1364 pages at $10.00.

Committee on Modern Languages.—During the year 1939–40, the Committee published three works: (1) *English Teaching in the Southwest: Organization and Materials for Instructing Spanish-speaking Children,* prepared by Algernon Coleman with the co-operation of Clara Breslove King (American Council on Education, 1940, 307 pp.); an investigation of the problem in the schools of Texas, New Mexico, Arizona, and California as concerns school population, curricular adjustment, attainment of specific abilities in English, and courses of study with an evaluation of textbooks used or prepared for English teaching and a selected bibliography. (2) *English Word Lists: A Study of Their Adaptability for Instruction,* by Charles C. Fries with the co-operation of A. Aileen Traver (American Council on Education, 1940, 107 pp.); an examination of the history and organization of limited vocabularies in English, with especial reference to seven English word-lists published as materials for early instruction in Eng-

lish. (3) *A Semantic Frequency List for English, French, German and Spanish* (University of Chicago Press, 1940, 441 pp.); a correlation of the first 6000 words in four single-language frequency lists, with full indices.

The Committee has now in hand the following undertakings: (1) A French Syntax-Frequency Count, organized by the late Algernon Coleman and now under the direction of Hayward Keniston. The count has been completed and the material is now being organized and will be published in the spring of 1941 in the form of a French Syntax Frequency List. (2) A German Syntax-Frequency Count under the direction of E. W. Bagster-Collins, Teachers College, Columbia University. The count has been completed and is now under revision. It is hoped that the resulting German Syntax Frequency List will be ready for publication in the fall of 1941. (3) An Analytical Bibliography of Modern Language Teaching. The collection of material is continuing in preparation for the publication of the third volume of this Bibliography covering the years 1938–42. The project is now under the direction of R. H. Fife.

In the spring of 1940, the chairman of the Committee, together with H. T. Manuel of the University of Texas, visited Puerto Rico and examined the possibility and desirability of a technical study of the teaching of English in the schools of that island. A report favoring such an undertaking was approved by the American Council on Education and means are being sought for a systematic investigation, in which the testing of achievement in English in all types of schools and all grades of instruction will be an important feature. Full co-operation has been assured by the Puerto Rican Department of Education and by representatives of the university at Rio Piedras.

The membership of the Committee continues the same as in 1938–39, i.e., R. H. Fife, Columbia University, chairman, who prepared this news item; C. C. Fries, University of Michigan; V. A. C. Henmon, University of Wisconsin; I. L. Kandel, Teachers College, Columbia University; Hayward Keniston, University of Michigan; J. B. Tharp, Ohio State University; and G. F. Zook, American Council on Education.

Carnegie Corporation of New York.—Grants made by the Corporation for library interests during 1939–40 totaled $374,520.

The sum of $459,500 was allotted to the arts. Museum enterprises received a total of $195,000. Music enterprises were supported to the extent of $101,000.

Grants to the amount of $2,026,947 were given for research, studies, and publications. In the field of research, a grant of $650,000 was made to Harvard University for the endowment of the School of Dental Medicine to forward the work of integrating the program of that school with the work of the Harvard Medical School. The Carnegie Foundation for the Advancement of Teaching received $123,600 for research and publications and the Carnegie Institution of Washington $150,000 for support.

The sum of $218,000 was allocated for the support of adult education. Of this amount, $134,500 was given to the American Association for Adult Education for the continuation of a study of the social significance of adult education, for experiments in the simplification of

reading materials for adults, for regional conferences, and for other projects.

Carnegie Foundation.—Under the cooperative arrangement between Carnegie Corporation of New York and the Foundation, there were twenty-two projects under way during the fiscal year, 1939–40, on grants totaling $169,035. From 1924 to June 30, 1940, Carnegie Corporation of New York has made to the Carnegie Foundation for the Advancement of Teaching 157 grants totaling $1,606,708 for 88 projects pertaining to the field of higher education. Of these projects, fourteen, involving $490,843 in 37 grants, have been carried on in the offices of the Foundation, while 74 projects involving $1,115,865 in 120 grants have been carried on under the auspices of 43 other educational institutions or bodies to which the Foundation has allocated and transmitted the funds involved.

Commonwealth Fund.—Appropriations of approximately $2,000,000 for philanthropic purposes are listed by the Commonwealth Fund in its report for the year ending September 30, 1940. A third of this total was devoted to medical research and medical education, and nearly half was earmarked for other health services, including chiefly aid to rural health departments and rural hospitals. Gifts amounting to $135,000 were made to meet special war needs through the American Red Cross, the Allied Relief Fund (now the British War Relief Society), the Finnish Relief Fund, the Harvard Medical School Epidemiological Commission to England, and the assistance of English refugees.

Because of the war, the number of Britons studying in this country as Commonwealth Fund Fellows has been cut from a normal quota of 65 to 16. Twelve of these are finishing a second year of work, having been appointed in 1939, and are subject to recall by the British, Australian, or New Zealand Government. Four new appointees, all ineligible for military service on medical grounds, came to the United States at the beginning of the present college year.

The Child Guidance Council, supported by the Fund to promote mental health work for children in England, has been even more active than in peacetime, British workers reporting that child guidance methods have proved their usefulness among children evacuated from London and other cities. The Council has shared in a special appropriation made by the British Government for mental health work during the war.

Science Teachers' Opinions on Some Socially Significant Issues.—The science teachers of the United States compose a group which has received varying degrees of specialized training in the methods and content of science. Presumably this training should have fitted them to take a responsible position in studying and dealing with many of the problems faced by society today. What are the opinions of these individuals so trained, concerning their responsibilities and upon some issues of basic importance in their teaching and in contemporary life? A study recently made for the Sub-committee on Teacher Education of the National Committee on Science Teaching by R. Will Burnett, Teachers College, Columbia University, the author of the present summary, sought the answer to these questions.

An opinionnaire was developed and distributed through the offices of the

Research Division of the National Education Association to science teachers throughout the United States. There is considerable assurance of the representativeness of the responses. To the extent that the responses are representative, the following points may be made with regard to this important group of the teaching profession:

1. A large majority (generally over 80 percent on specific problems) of the science teachers at all levels of school work, in all parts of the country, in communities of all sizes, and with various science and non-science backgrounds of major interest, conceive their major function to be that of facing the problems and interests of young people and society, and in bringing their specialized abilities to bear on these problems and interests.
2. In spite of this professed belief in such a responsibility, the teachers of science are avoiding, for the most part, a number of important fields in their teaching which represent problems that young people must, or are extremely likely to, face.
3. The teachers of science are avoiding these issues which they accept as of importance primarily because of fear of disapproval of parents, because of the immaturity of pupils, and because of a belief that they as teachers have insufficient knowledge of the areas to handle them adequately.
4. Despite this fear of personal incompetency, the opinions of the majority of teachers on a number of issues of basic importance in America today are supported by the best scientific opinion.
5. A remarkable homogeneity of opinion upon these basic issues was found among the teachers with different backgrounds of formal education. It is clear that it has made little or no difference whether the teachers have had their major work in biological science, physical science, or non-science, or whether they have taken sociology, philosophy, anthropology, or genetics. Either such fields and courses have paid little or no attention to these issues or their effect on the opinions of individuals has been negligible. This lack of emphasis has undoubtedly resulted in the reticence which teachers disclose to teach in areas of admitted importance.

If the teachers of science are to discharge their duty to American society and to young people as they see that duty, the teacher training programs in the future should:

1. Re-organize the work in science and related fields away from the logical organization of subject-matter to organizations and contents of a more functional nature.
2. Allow teachers greater opportunity to study young people of various ages and to gain experience in teaching in areas of importance to such immature individuals.
3. Implement educational theories through practical demonstrations and opportunities for student participation which will test and illustrate the adequacies of such theories, so as to indicate to student teachers the practicability of dealing with the problems with which young people and society must, or will choose to, deal.

Finally, if teachers in service are to fulfill the responsibility they believe to be their own, more adequate channels of in-service education should be opened. These channels should provide scientific data on the important problems facing young people and society today, and should coordinate and disseminate the many important contributions to significant curriculum development growing out of experimentation and research in the United States today.

Harvard Projects.—Research in educational administration occupies a pivotal position in a new program begun last fall at the Harvard Graduate School of Education, under the direction of A. D. Simpson. The plan represents a balanced and mutually complementary emphasis upon research, service, and instruction in educational administration. The research part of the program aims to analyze specific educational situations, regional and statewide areas, in the light of current social and economic conditions; to examine intensively the structural, financial, political, or other factors influencing organization and administration; and to develop within a democratic framework effective patterns of public policy. The service aim of the plan is to offer to school officers assistance in putting into effect policies and programs which recognize the substantial contributions of research and the total governmental situation, as well as the currently critical educational need. The instructional emphasis of the plan is to employ both the research and the service procedures in a program to be marked by an emphasis upon leadership in the development of educational policy. All in all, the basic emphasis of the entire program is upon educational policy as contrasted to procedural training. In this aim, broad application will be made wherever needed of those disciplines—public law, finance, and the like—which are ancillary to educational administration. The breadth of the program is assured by its close association with the Littauer Center of Public Administration, with freedom of access to the Littauer library and seminars. As the new program gets under way, research and service projects of promise are being organized in both state and local school systems, as well as in educational associations in the New England area, embracing such fields as state school support, occupational preparation, school district organization, school housing, and tort liability.

To give its students preparing for administrative and supervisory positions in secondary schools first-hand experience in investigating problems of importance to them when they have gone out into the field, the Harvard Graduate School of Education has for a number of years been maintaining a cooperative research group in secondary-school problems, under the leadership of W. C. Seyfert. Each year this group is made up of students who have completed their regular course work in administration, plus a number of administrative officers from secondary schools in areas surrounding Cambridge. These administrators come in at the invitation of the faculty members sponsoring the group. The project or projects undertaken are determined by the interests of the members of the group. An effort is made in any case to select one, or at most two, problems of real and immediate concern in all of the schools represented in the group. Plans for the chosen investigation are drawn up by the group. The student members undertake

the actual research work involved. The entire group then meets to consider the implications of the findings. In recent years these groups have studied such problems as public opinion about schools, the movie-going habits of junior high school pupils, and the nature of the occupational and vocational plans with which young people are equipped on graduation from high school.

The School of Education, through its connection with a Paris clipping bureau administered by German refugees, has been able to collect several thousand clippings from newspapers of all important European countries, dealing with their educational policy and their intercultural relations. The clippings cover the extremely interesting years from 1936 to 1940 when the work of the Paris bureau was stopped by the invasion. The material is now systematically ordered, under the direction of Robert Ulich, and reveals an astonishing mass of information on the relationship between education and the political and cultural movements of the European countries before the current war. It is hoped that this collection of editorials, articles, and news reports will provide a basis for research on the relationship between education on the one hand and the political and cultural life on the other hand.

Indiana Studies.—During the past year, the School of Education at Indiana University has published a study of interest to both teachers and school administrators in Indiana, since it deals with the problem of tenure. *Teacher Tenure in Indiana and the Courts,* by H. L. Smith and R. Foster Scott, is an analysis and summarization of a century of Indiana laws and of one hundred appeal cases which pertain to the employment and tenure privileges and obligations of teachers in the public schools of Indiana. Another legal study now under way is a discussion of the legal factors involved in those relations of parents and patrons to the schools of Indiana which are made through the pupils' activities and place in the school system.

In the field of school finance, a study was completed early in 1940 by R. W. Holmstedt on the subject of *State Control of Public School Finance.* This is a discussion of the bases, nature, and purposes of state control of school finance in the various states and the allocation of control of finance in the school systems of these states.

Two investigations of achievement of college students have been made by H. L. Smith and M. T. Eaton. One deals with the achievement of a group of graduate students at Indiana University in English usage, spelling, and vocabulary; the second is an analysis of the abilities of a group of university sophomores, as based on their college marks and the results of tests in English, reading, general achievement, and aptitude. Both of these studies reveal definite needs in the training of college students.

Smith and Eaton have also made an experimental study of standards for the selection of candidates for teacher training institutions. While these standards are set up only tentatively, they offer suggestions to those who are interested in establishing standards of this type.

The School of Education has become a source of carefully compiled bibliographies. Work is being continued in this field and a supplement (Part V) to the *Bibliography of School Buildings, Grounds, and Equipment* will soon be published, thus bringing this bibliography up to January 1, 1937. Future supplements are in the making, as well

as bibliographies in other areas of education.

The director of the Bureau of Cooperative Research is H. L. Smith.

Minnesota Research.—During 1940–41 the University Committee on Educational Research is sponsoring investigations in nine divisions of the university, as well as general surveys of student interest, activities, and attitudes involving high schools and colleges throughout Minnesota. The early identification of potentially gifted and handicapped students is being sought in three studies: (1) an investigation of success in mathematics in the Institute of Technology, (2) an evaluation of the tests given Medical School entrants, and (3) an exploration of the relation of scholastic achievement, interests, and personality characteristics to success in journalism. In two researches the goal is the formulation of needed measuring instruments—a Social Studies Skills Test for the college level and a series of comprehensive examinations in pharmacy.

Personnel investigations include a follow-up of 4000 former N. Y. A. students, an interview study of 200 gifted university seniors, a survey of the educational and vocational status of recent Minnesota high school graduates, and an analysis of the out-of-school activities of students withdrawing from Minnesota colleges during their freshman year.

Several investigations seek to provide a more realistic basis for curriculum building. To reveal changing professional demands and opportunities, studies are being made of the problems, activities, and needs of dental hygienists and of social workers in Minnesota. In the College of Education, outcomes of an integrated course and of traditional offerings in educational psychology, principles, and methodology are being evaluated. Appraisals of Vocational and Individual Orientation, two General College core areas, are nearing completion; Individual Orientation and Socio-Civic Orientation will be studied intensively this year to test the validity of a "functional-need" approach to curriculum organization. Exploratory studies are also being initiated in the College of Science, Literature, and Arts to find out how much general education typical liberal arts and preprofessional students receive through present offerings, and what problems must be faced in evolving a general education program suited to the university's more able students.

The chairman of the Committee on Educational Research is T. R. McConnell.

Missouri Studies.—Two recent investigations at the University of Missouri are concerned with the N. Y. A. program, by W. R. Carter, and typewriting in the elementary school, by C. A. Phillips.

The first report represents a subjective study of the values which N. Y. A. students think they have obtained from N. Y. A. work and of the values which project supervisors believe have resulted from the projects which they sponsored. It is a questionnaire study, including replies from 540 N. Y. A. workers and from 92 project supervisors connected with the N. Y. A. work projects at the University of Missouri for the school year of 1939–1940. Student N. Y. A. workers expressed opinions with respect to the value of the financial assistance obtained through N. Y. A. work, the contributions made by N. Y. A. work to the education of the student, its contributions to the personal and social development of the student, possible negative in-

fluences of N. Y. A. work upon scholarship, general recreation or participation in extra curricular activities, and student criticisms of the N. Y. A. work program, with suggestions for its improvement. N. Y. A. project supervisors were asked to express opinions as to the sincerity and conscientiousness of N. Y. A. workers, their attitudes toward N. Y. A. assistance, the values of N. Y. A. work in the personal or social development of the worker, and the values of N. Y. A. work to the university, to the state, or to the supervisor. Supervisors also were asked to offer suggestions for the improvement of the N. Y. A. work program. Project supervisors made a good case for the real worth of the work accomplished on the projects which they supervised. Both supervisors and students reported many values of N. Y. A. work experience besides the financial assistance involved. The criticisms of the N. Y. A. work program and suggestions for its improvement made by both students and supervisors were generally positive and constructive, and it is believed that this study reveals a number of ways in which the administration of the N. Y. A. work program might be improved.

The second research project, concerned with teaching children to use the typewriter in the Elementary Division of the Laboratory School, was initiated in the second grade, September, 1937. The experiment is now in its fourth year. This report includes some of the results of the first three years of the study. The objectives were stated at the outset as follows:

1. To discover how early in their school career elementary pupils may learn to use the typewriter efficiently.
2. To determine as far as possible how much the use of the typewriter may contribute directly to the ordinary learning activities of the elementary school: to spell, to read, and to use correct English.
3. To discover how much value the use of the typewriter may have in connection with the creative work of the pupils.
4. To try to determine standards of achievement for both quantity and quality of typewritten work for the various grade levels. (Adopted at the beginning of the third year of the study.)

The same twenty-two pupils have participated in the entire experiment. They were paired with a control group on the basis of C.A., M.A., and E.A. A well trained graduate student supervised by the director of the laboratory school has been in charge of the experiment from its beginning. The equipment includes suitable chairs, tables, and twelve portable typewriters.

The results in spelling for each year have been markedly superior for the experimental group. Pupils are enthusiastic about their creative writing, copying short stories and poems, and creating various designs for school activities. A comparison between the rate of cursive writing and written work on the typewriter indicates that the pupils have been able to write at a mean rate of 67.3 per cent faster on the typewriter than in cursive writing. The range is from 30.4 to 120.0 letters per minute written on the typewriter. At the close of the third year of the experiment, the pupils could type with a mean efficiency of 85 per cent. The range is from 65 to 97 per cent. In the course of the experiment a technique for measuring efficiency has been developed. To date, the experiment indicates that the typewriter is an efficient tool when used in connection with various features of instruction in an elementary school.

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